

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of  
Timothy A. Coleman

Application No.: 09/921,143

Group Art Unit: 1653

Filed: August 3, 2001

Examiner: Not Yet Assigned

For: Vascular Endothelial Growth Factor 2

**PETITION UNDER 37 C.F.R. § 1.137(b) FOR  
REVIVAL OF AN UNINTENTIONALLY ABANDONED APPLICATION**

**Box DAC**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Applicant hereby petitions for revival of an abandoned application under 37 C.F.R. § 1.137(b). The application was unintentionally abandoned due to an incomplete response that was filed to the Notice to File Missing Parts of Nonprovisional Application, which was mailed on September 27, 2001. Applicant submits concurrently herewith: (1) a fee transmittal with appropriate fees and (2) Exhibits A-C.

**I. Background**

Although no written notice of abandonment has been received, on Wednesday, May 14, 2003, Applicant's representative, Melissa Pytel, was notified by a phone call from Ms. Roxanne Rawls of the United States Patent and Trademark Office ("PTO"), that the present application was abandoned. Applicant asserts that the abandoned status of the instant application occurred despite the exercise of due care and diligence on the part of Applicant and Applicant's representatives.

A timeline of events is provided below:

September 27, 2001: A "Notice to File Missing Parts of Nonprovisional Application" was mailed (hereinafter referred to as "the Notice"). A copy of the Notice is included herewith as **Exhibit A**. The Notice indicated that the Oath or Declaration was

unsigned, that a late filing fee surcharge of \$130 was due and that substitute drawings were required. Specifically, the Notice indicated that the drawing sheets did not have the appropriate margins in compliance with 37 C.F.R. § 1.84.

November 20, 2001: Applicant filed a timely response to the Notice by providing an executed Declaration and authorizing the Commissioner to charge the proscribed fee to Deposit Account No. 08-3425 (hereinafter referred to as "the Response"). A copy of the Response, along with the date-stamped return receipt postcard, is included herewith as Exhibit B. Inadvertently, the timely response submitted by Applicant did not include a submission of corrected drawings.

February 4, 2002; March 12, 2002; April 18, 2002; August 16, 2002, and September 12, 2002: Subsequent to filing the Response, Applicant diligently maintained the instant application by filing multiple Information Disclosure Statements on February 4, 2002; March 12, 2002; April 18, 2002; August 16, 2002; and September 12, 2002, in accordance with Applicant's duty of disclosure under 37 C.F.R. § 1.56.

December 13, 2002: Applicant mailed a Status Inquiry to be advised of the status of the instant application, because Applicant had not received any correspondence from the PTO subsequent to the mailing of Applicant's November 20, 2001 Response.

April 1, 2003 (approx.): Applicant's representative, Lin Hymel, received a phone call from Ms. Roxanne Rawls regarding the instant application.

April 9, 2003: After several attempts to contact Ms. Rawls, Applicant's representative, Melissa Pytel, spoke with Ms. Rawls regarding the instant application. At this time, Ms. Rawls merely requested a submission of replacement drawings. The status of the application was not discussed.

April 17, 2003: In response to the discussion with Ms. Rawls, Applicant prepared and filed Replacement Formal Drawings.

May 14, 2003: Ms. Rawls contacted Melissa Pytel, indicating that a Petition to Revive an Abandoned Application would need to be filed due to the incomplete response to the Notice to File Missing Parts.

May 21, 2003: After multiple phone calls with Ms. Rawls, in which alternatives to filing a Petition to Revive an Abandoned Application were discussed, Applicant's representative, Melissa Pytel contacted Ms. Doshie Day in the Office of Initial Patent

Examination (OIPE) to inquire whether a notice under 37 C.F.R. § 1.135(c) could be issued to avoid abandonment of the Application, since Notice of Abandonment had not been received by Applicant. Ms. Day indicated that she would discuss this case with someone in the Petitions Branch.

May 22, 2003: Applicant's representative, Melissa Pytel, left a message with Ms. Day, inquiring whether Ms. Day had the opportunity to speak with Petitions.

May 23, 2003: Applicant's representative, Melissa Pytel, left a message with Ms. Day, indicating that she (Melissa) would be out of the office the following week and that Michele Wales could be contacted in her absence.

May 29, 2003: Applicant's representative, Michele Wales, contacted Ms. Day to discuss the status of the application. Ms. Day confirmed that a Petition to Revive would have to be filed.

June 5, 2003: Applicant's representative, Melissa Pytel, checked the status of the Application in the Patent Application Information Retrieval (PAIR) system. As of June 5, 2003, the Application was still not indicated as abandoned.

## II. Petition to Revive

Pursuant to 37 C.F.R. § 1.137(b), Applicants are required to submit a complete reply to the Notice to File Missing Parts, which was mailed on September 27, 2001 and the petition fee set forth in 37 C.F.R. § 1.17(m). Although Applicant previously filed Replacement Formal Drawings on April 17, 2003, copies of the Replacement Formal Drawings as filed April 17, 2003 and accompanying documents are included herewith as "Exhibit C." Applicant hereby authorizes the Commissioner to charge the proscribed petition fee under 37 C.F.R. § 1.17(m) to Deposit Account No. 08-3425. Applicant also asserts that the entire delay in filing the reply was unintentional, from the due date for the reply until the filing of the instant petition, as demonstrated by the evidence provided above.

Furthermore, as required by the Manual of Patent Examining Procedure (M.P.E.P. § 711.03(c)(III)(D) at page 700-154-155 (8<sup>th</sup> Ed. 2001)) when a Petition to Revive is not filed within one year of the effective date of abandonment, Applicant submits that the evidence provided above shows that Applicant only became aware of the abandonment of


the instant application on May 14, 2003. Applicant further submits that the evidence provided above demonstrates how the delay in discovering the abandoned status of the instant application occurred despite the exercise of due care or diligence on the part of the Applicant, or Applicant's representative.

In sum, the instant application became abandoned due to the unintentional delay in responding to the Notice. Applicant has satisfied all of the requirements under 37 C.F.R. § 1.137(b) by providing (1) a complete reply to the Notice to File Missing Parts; (2) the petition fee set forth in 37 C.F.R. § 1.17(m); and (3) a statement that the entire delay in responding in full from the due date for the reply until the filing of the instant petition pursuant to 37 C.F.R. § 1.137(b) was unintentional. Furthermore, Applicant has satisfied the additional requirements where a petition pursuant to 37 C.F.R. § 1.137(b) is not filed within one year of the effective date of abandonment by: (A) providing information as to when Applicant first became aware of the abandonment of the instant application and; (B) showing how the delay in discovering the abandoned status of the instant application occurred despite Applicant's exercise of due care and diligence.

Applicant hereby requests that the instant petition under 37 C.F.R. § 1.137(b) for revival of an abandoned application due to the unintentional delay by Applicant be granted and the instant application be revived. In the event that an additional fee may be required, please charge the fees to our Deposit Account No. 08-3425.

Dated: June 9, 2003

Respectfully submitted.

By   
Melissa J. Pytel (Registration No. 41,512)  
Attorney for Applicant

HUMAN GENOME SCIENCES, INC.  
9410 Key West Avenue  
Rockville, MD 20850  
Phone: 301-610-5764

MMW/MJP/ba

Exhibit A

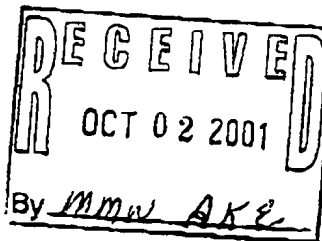


UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/921,143	08/03/2001	Timothy Coleman	PF112P6

22195  
HUMAN GENOME SCIENCES INC  
9410 KEY WEST AVENUE  
ROCKVILLE, MD 20850



CONFIRMATION NO. 6449

FORMALITIES LETTER



\*QC000000006803645\*

Date Mailed: 09/27/2001

**NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION**

FILED UNDER 37 CFR 1.53(b)

*Filing Date Granted*

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is unsigned.
- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(i) of \$130 for a non-small entity, must be submitted with the missing items identified in this letter.
- The balance due by applicant is \$ 130.

The application is informal since it does not comply with the regulations for the reason(s) indicated below

The required item(s) identified below must be timely submitted to avoid abandonment:

- Substitute drawings in compliance with 37 CFR 1.84 because:
  - drawing sheets do not have the appropriate margin(s) (see 37 CFR 1.84(g)). Each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. ( 5/8 inch), and a bottom margin of at least 1.0 cm. (3/8 inch);

*A copy of this notice **MUST** be returned with the reply.*

Customer Service Center  
Initial Patent Examination Division (703) 308-1202

Exhibit B

HUMAN GENOME SCIENCES, INC.

Please date stamp and return to addressee on reverse side

Applicants: Coleman, T.

Docket No. PF112P6

Application No.: 09/921,143

Filed: August 3, 2001

Title: Vascular Endothelial Growth Factor-2



**Documents Filed Via Hand Delivery on November 20, 2001**

1. Postcard (1);
2. Fee Transmittal for FY 2002 (with appropriate fees) (in duplicate);
3. Copy of Notice to File Missing Parts of Nonprovisional Application Filed Under 37 CFR 1.53(b) dated September 27, 2001;
4. Response to Notice to File Missing Parts;
5. Recordation Form Cover Sheet (in duplicate) and Assignment (2 pp.); and
6. Declaration for Patent Application (2 pp.).

MMW/JLK/ap

Attn.: Legal Department



<h1 style="text-align: center;">FEE TRANSMITTAL</h1> <h2 style="text-align: center;">for FY 2002</h2> <p style="text-align: center;">(Substitute form)</p> <p style="text-align: center;"><i>Patent fees are subject to annual revision</i></p>		<i>Complete if Known</i>	
		Application Number	09/921,143
		Filing Date	August 3, 2001
		First Named Inventor	Coleman, T
		Examiner Name	To Be Assigned
		Group Art Unit	1633
Total amount of payment	\$170.00	Attorney Docket Number	PF112P6

METHOD OF PAYMENT		FEE CALCULATION (continued)																																																																																																																																																																						
<p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:</p> <p>Deposit account Number: 08-3425</p> <p>Deposit account Name: Human Genome Sciences, Inc.</p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR §§ 1.10 and 1.17</p> <p><input type="checkbox"/> Applicant claims small entity status See 37 CFR 1.27</p> <p>2. <input type="checkbox"/> Payment Enclosed:  <input type="checkbox"/> Check <input type="checkbox"/> Credit Card <input type="checkbox"/> Money Order <input type="checkbox"/> Other</p>		<p>3. ADDITIONAL FEES</p> <table border="1"> <thead> <tr> <th>Fee Code</th> <th>Large Entity Fee (\$)</th> <th>Small Entity Fee (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>102</td><td>140</td><td>20</td><td>Surcharge - late filing fee of 20%</td><td>\$130.00</td></tr> <tr><td>127</td><td>50</td><td>25</td><td>Surcharge - late provisional filing fee of cover sheet</td><td></td></tr> <tr><td>128</td><td>150</td><td>75</td><td>Non-English specification</td><td></td></tr> <tr><td>142</td><td>1,200</td><td>300</td><td>Utility issue fee (or reward)</td><td></td></tr> <tr><td>143</td><td>200</td><td>100</td><td>Publication fee for early, voluntary, or normal publication</td><td></td></tr> <tr><td>179</td><td>740</td><td>270</td><td>Request for Continued Examination (RCE)</td><td></td></tr> <tr><td>193</td><td>120</td><td>60</td><td>Processing fee, except in provisional applications</td><td></td></tr> <tr><td>126</td><td>150</td><td>75</td><td>Submission of Information Disclosure Statement</td><td></td></tr> <tr><td>123</td><td>50</td><td>25</td><td>Processing fee for provisional applications</td><td></td></tr> <tr><td>140</td><td>740</td><td>270</td><td>Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr> <tr><td>142</td><td>740</td><td>270</td><td>For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr> <tr><td>145</td><td>100</td><td>50</td><td>Certificate of correction</td><td></td></tr> <tr><td>147</td><td>2,320</td><td>580</td><td>Request for after patent reexamination</td><td></td></tr> <tr><td>099</td><td>8,000</td><td>3,000</td><td>Request for inter partes reexamination</td><td></td></tr> <tr><td>148</td><td>110</td><td>55</td><td>Statutory disclaimer</td><td></td></tr> <tr><td>115</td><td>110</td><td>55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116</td><td>100</td><td>50</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117</td><td>920</td><td>460</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118</td><td>1,430</td><td>720</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>119</td><td>1,940</td><td>980</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119</td><td>220</td><td>110</td><td>Notice of appeal</td><td></td></tr> <tr><td>120</td><td>320</td><td>160</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121</td><td>280</td><td>140</td><td>Request for oral hearing</td><td></td></tr> <tr><td>122</td><td>130</td><td>65</td><td>Petition to the Commissioner</td><td></td></tr> <tr><td>140</td><td>110</td><td>55</td><td>Petition to revive unadversely abandoned application</td><td></td></tr> <tr><td>141</td><td>1,280</td><td>320</td><td>Petition to revive unadversely abandoned application</td><td></td></tr> <tr><td>091</td><td>1,280</td><td>320</td><td>Acceptance of an unintentionally delayed claim for priority</td><td></td></tr> <tr><td>301</td><td>5</td><td>5</td><td>Printed copy of patent, regular service</td><td></td></tr> <tr><td>301</td><td>40</td><td>40</td><td>Recording each patent document per property (times number of properties)</td><td>\$40.00</td></tr> <tr><td colspan="4">Other fee (specify):</td><td></td></tr> <tr><td colspan="4">Other fee (specify):</td><td></td></tr> <tr><td colspan="4">Other fee (specify):</td><td></td></tr> </tbody> </table>		Fee Code	Large Entity Fee (\$)	Small Entity Fee (\$)	Fee Description	Fee Paid	102	140	20	Surcharge - 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Submitted By		Complete (if applicable)	
Name (Print/Type): Jonathan L Klein	Registration No. 41,119	Telephone	301-231-6013
Signature: <i>Jonathan L Klein</i>	Date: 11/20/01		

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of Coleman, T.

Application Serial No 09/921,134

Group Art Unit: 1653

Filed: August 3, 2001

Examiner: Not assigned

For: Vascular Endothelial Growth Factor-2

Attorney Docket No.: PF112P6

**RESPONSE TO NOTICE TO FILE MISSING PARTS**

Commissioner For Patents  
BOX MISSING PARTS  
Washington, D.C. 20231  
Sir.

In response to the Notice to File Missing Parts mailed September 27, 2001, submitted herewith is: (a) an executed Declaration and Power of Attorney, (b) a Fee Transmittal for FY 2002 with appropriate filing fee (in duplicate); and (c) a copy of said Notice.

The Commissioner is hereby authorized to charge the required fee of \$130.00 and any other fee deemed necessary to Deposit Account No. 08-3425.

Respectfully submitted,

Dated: November 20, 2001

  
Jonathan L. Klein Reg. No. 41,119  
Attorney for Applicants

**Human Genome Sciences, Inc.**  
9410 Key West Avenue  
Rockville, Maryland 20850  
301-251-6015 (telephone)

MMW/JLK

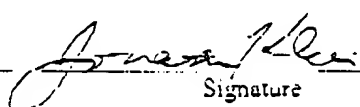
Notice to File Missing Parts



PART 1 - ATTORNEY/APPLICANT COPY

## U.S. PATENT AND TRADEMARK OFFICE

BOX ASSIGNMENTS  
Case Docket No. PF112P6U.S. DEPARTMENT OF COMMERCE  
Patent and Trademark OfficeRECORDATION FORM COVER SHEET  
PATENTS ONLYTo the Honorable Commissioner of Patents and Trademarks.  
Please record the attached original documents or copy thereof.

<b>1. Name of conveying party(ies):</b>  Timothy A. Coleman  Additional name(s) of conveying party(ies) attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		<b>2. Name and address of receiving party(ies):</b>  Name: Human Genome Sciences, Inc. Street Address: 9410 Key West Avenue City: Rockville, Maryland 20850  Additional name(s) of conveying party(ies) attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>3. Nature of conveyance</b>  <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Merger <input type="checkbox"/> Security Agreement <input type="checkbox"/> Change of Name <input type="checkbox"/> Other _____  Execution Date: 11/01/01		
<b>4. Title: Vascular Endothelial Growth Factor-2</b>		
<b>5. Application number (s) or patent numbers (s)</b>  If this document is being filed together with a new application, the execution date of the application is *****		<b>A. Patent Application No (s)</b> 09/921,143 <b>B. Patent No</b> Additional numbers attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<b>6. Name and address of party to whom correspondence concerning documents should be mailed:</b> Human Genome Sciences, Inc. 9410 Key West Avenue Rockville, Maryland 20850 Telephone: 301-309-8504      Facsimile: 301-309-8439		
<b>7. Total of applications and patents involved</b>		1
<b>8. Total Fee (37 CFR 3.41)</b>		\$40.00
<input type="checkbox"/> Enclosed (By check in total of filing fee and Assignment Recordation Fee) <input checked="" type="checkbox"/> Authorized to be charged to Deposit Account		
<b>9. Deposit Account No.</b>		08 3425 (Attached duplicated copy of this page if paying by deposit account)
<b>10. If any additional fees due in connection with the recordation of this Assignment, please charge the same to Deposit No. 08-3425</b>		
<b>11. Statement and Signature</b> The best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.  Jonathan L. Klein Name of Person Signing 41,119 Registration No.   Signature  11/20/01 Date		
Total number of pages including cover sheet, attachment, and documents [ 3 ]		

## ASSIGNMENT

For good and valuable consideration, the receipt of which is hereby acknowledged, the undersigned, Timothy A. COLEMAN, hereby sells, assigns, transfers, and sets over to Human Genome Sciences, Inc. ("Assignee") having a place of business at 9410 Key West Avenue, Rockville, MD 20850, its successors, assigns and legal representatives, his entire right, title and interest, including the right to sue and collect for all past, present and future damages, for the United States of America, including all its territories and possessions, and all other countries,

- (a) in and to the invention(s) known as Vascular Endothelial Growth Factor-2 for which application(s) for patent in the United States of America has (have) been executed by the undersigned on November 1, 2001 (also known as United States Application No. 09/921,143, and filed August 3, 2001), in any and all applications thereon, in any and all Patent(s) therefor, and
- (b) in any and all applications that claim the benefit of the patent application listed above in part (a), including continuing (continuation, divisional) applications, reissues, extensions, renewals and reexaminations of the patent application or patent therefor listed above in part (a), to the full extent of the term or terms for which patents issue, and
- (c) in any and all inventions described in the patent application listed above in part (a), and in any and all forms of intellectual and industrial property protection derivable from such patent application, and that are derivable from any and all continuing applications, reissues, extensions, renewals, and examinations of such patent application, including, without limitation, patents, applications, utility models, inventor's certificates, and designs together with the right to file applications therefor; and including the right to claim the same priority rights from any previously filed applications under the International Agreement for the Protection of Industrial Property, or any other international agreement, or the domestic laws of the country in which any such application is filed, as may be applicable;

all such rights, title and interest to be held and enjoyed by the above-named Assignee, its successors, legal representatives and assigns to the same extent as all such rights, title and interest would have been held and enjoyed by the Assignor had this assignment and sale not been made

The undersigned further agrees that said Assignee may apply for and receive patent(s) for said invention(s) in its own name, and agrees to execute all papers necessary in connection with said application(s) and any continuing application(s) (continuation, divisional, or continuation-in-part), substitutes, renewals, reissues, reexaminations, extensions, and all other patent applications on all such invention(s), including all rightful oaths, declarations, powers of attorney and other papers, and agrees to execute separate assignments in connection with such application(s) as the Assignee may deem necessary and expedient, and agrees to communicate to said Assignee, its successors, assigns, and representatives all facts known to the undersigned relating to said invention(s) and the history thereof; and agrees to cooperate fully and completely with said Assignee, its successors, assigns, and representatives in securing, maintaining, and enforcing proper patent protection for said invention(s) and for vesting title to said invention(s) and all patent applications and all patents on said invention(s) in Assignee, its successors, assigns and representatives

The undersigned agrees to execute all papers necessary in connection with any interference that may be declared or litigation that may be instituted concerning the application(s) or patent(s) referred to above and to cooperate fully and completely with the Assignee, its successors, assigns, and representatives in obtaining evidence and going forward with such interference or litigation, including providing testimonial evidence.

The undersigned hereby represents and warrants to Assignee, its successors, assigns and representatives that no assignment, grant, mortgage, license or other right or agreement affecting the rights and property herein conveyed has been or will be made to others by the undersigned and that full right to convey the same as expressed herein is possessed by the undersigned

The undersigned hereby grants the power to the Practitioners at Customer Number 22195 as my attorney(s) or agent(s) with full power to insert on this Assignment any further identification which may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

IN WITNESS WHEREOF, this Assignment is executed by the undersigned on the date opposite his signature

Inventor's Signature: Timothy A. Coleman Date: 11/1/01  
Timothy A. Coleman

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I declare that I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**VASCULAR ENDOTHELIAL GROWTH FACTOR-2**

the specification of which was filed on August 3, 2001 as Application Serial No. 09/921,143 and was amended on \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application, which designated at least one country other than the United States listed below, and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed. Prior Foreign Application(s):

			<u>Priority Claimed</u>	
			Yes	No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)		

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below:

<u>60/223,276</u>	<u>August 4, 2000</u>
(Provisional App. Serial No.)	(Filing Date)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) or under § 365(b) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status: patented, pending, abandoned)
-----------------------------------	------------------------	--



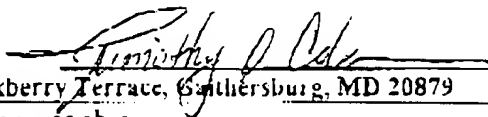
I hereby appoint the Practitioners at Customer Number 22195 as my attorney(s) or agent(s) with full power of substitution, association, and revocation to prosecute the application identified above, including any continuation or divisional applications, and to transact all business in the U.S. Patent and Trademark Office connected therewith. Direct all correspondence to the above-mentioned Customer Number, namely 22195

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole inventor:

Timothy A. COLEMAN

Inventor's signature:



Date:

11/1/01

Residence:

7512 Boxberry Terrace, Gaithersburg, MD 20879

Citizenship:


US

Post Office Address:

same as above

Exhibit C

**RETURN RECEIPT CARD**  
(MPEP § 503)

<b>OIPE:</b>	Please Date Stamp In The Box Below And Return To Addressee
	

Application of:  
Timothy A. Coleman

Docket No.: PF112P6

Application Serial No.: 09/921,143-Conf. #6449

Art Unit: 1653

Filed: August 3, 2001

Examiner: Not Yet Assigned

Title: Vascular Endothelial Growth Factor 2

**The following documents were filed by Human Genome Sciences, Inc.  
via hand delivery on April 17, 2003:**

1. Return Receipt Postcard;
2. Communication,
3. Preliminary Amendment;
4. Submission of Replacement/Substitute Drawings;
5. Substitute Drawings (68 Sheets, Figs. 1A-3111).

MMW/MJP/AKR/lcc Attn: Legal Dept.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of  
Timothy A. Coleman

Application No. : 09/921,143

Group Art Unit: 1653

Filed: August 3, 2001

Examiner: Not Yet Assigned

For: Vascular Endothelial Growth Factor 2

COMMUNICATION

Commissioner for Patents  
Washington, DC 20231

Approximately around April 1, 2003, Applicants' representative received a phone call from Roxanne Rawls at the United States Patent and Trademark Office (USPTO) requesting the submission of replacement drawings, as the margins of the current drawings were not in compliance with 37 C.F.R. § 1.84. Mrs. Rawls referred to the September 27, 2001, "Notice to File Missing Parts of Nonprovisional Application," which indicated that the submitted drawing sheets did not have the appropriate margins in compliance with 37 C.F.R. § 1.84. Inadvertently, no corrected drawings were filed with the response to the formalities letter. Therefore, submitted concurrently herewith is a Submission of Substitute/Replacement Drawings in compliance with 37 C.F.R. § 1.84.

No fee is believed due for this submission. In the event that a fee is required in connection with this submission, please charge the required fee to Deposit Account No. 08-3425.

Respectfully submitted,

Dated: April 17, 2003



Melissa J. Pytel

Registration No. 41,512  
**HUMAN GENOME SCIENCES, INC.**  
9410 Key West Avenue  
Rockville, Maryland 20850  
(301) 610-5764  
Attorney for Applicants

Docket No.: PF112P6  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Timothy A. Coleman

Application No.: 09/921,143

Group Art Unit: 1653

Filed: August 3, 2001

Examiner: Not Yet Assigned

For: Vascular Endothelial Growth Factor 2

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, DC 20231

Dear Sir:

Prior to examination on the merits, please amend the above-identified U.S. patent application as follows. Applicants submit herewith: (a) Communication; (b) Submission of Replacement/Substitute Drawings; and (c) 68 sheets of drawings containing Figures 1A-31U.

Please amend the specification as follows.

*In the specification:*

Please replace the paragraph beginning on page 7, line 23 with the following rewritten paragraph:

~~Figure 31 A-G~~Figure 31A-U shows the nucleotide sequence of the pVGI.1 vector construct containing the VEGF-2 insert (SEQ ID NO:36).

Remarks

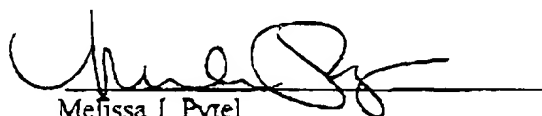
The specification was amended to replace language reciting, "Figure 31A-G" with language reciting, "Figure 31A-U." This amendment is requested upon approval of the Submission of Formal Drawings, submitted concurrently herewith. Applicants submit that the amendment does not introduce new matter under 35 U.S.C. § 132. Therefore, entry of the amendments is respectfully requested.

Conclusion

No fee is believed due for this submission. In the event that a fee is required in connection with this submission, please charge the required fee to Deposit Account No. 08-3425.

Respectfully submitted,

Dated: April 17, 2003



Melissa J. Pytel

Registration No. 41,512  
**HUMAN GENOME SCIENCES, INC.**  
9410 Key West Avenue  
Rockville, Maryland 20850  
(301) 610-5764  
Attorney for Applicants

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:  
Timothy A. Coleman

Docket No.: PF112P6

Application No.: 09/921,143

Group Art Unit: 1653

Filed: August 3, 2001

Examiner: Not Yet Assigned

For: Vascular Endothelial Growth Factor 2

SUBMISSION OF REPLACEMENT/SUBSTITUTE DRAWINGS

Attn: Draftsperson  
Commissioner for Patents  
Washington, DC 20231

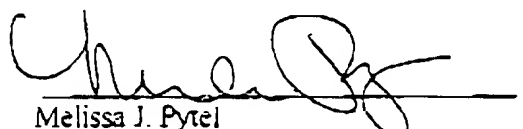
Sir:

Applicants submit herewith replacement/substitute Figures 1A-31U (68 sheets) to replace Figures 1A-31G (47 sheets) as originally filed. Additional pages are due to reorganization of the drawings in order to comply with the margin requirements under 37 C.F.R. § 1.84. No new matter is introduced.

No fee is believed due for this submission. In the event that a fee is required in connection with this submission, please charge the required fee to Deposit Account No. 08-3425.

Respectfully submitted,

Dated: April 17, 2003

  
Melissa J. Pytel  
Registration No. 41,512  
HUMAN GENOME SCIENCES, INC.  
9410 Key West Avenue  
Rockville, Maryland 20850  
(301) 610-5764  
Attorney for Applicants





# MATCH WITH FIG. 1A

361	AGATCTTGAAAAAGTATTGATATATGAGTGGAGAAAGACTCAATGGCATGCCACGGGAGGNGT	420
	TTCTAGAAACATTTCATATACTTACTCACTCTTTCTTGAGTTACGTACGGGTGCCCTGCACA	
	J L K S I D N E W R K T Q C M P F E V C	
421	CTATAGATGTGTGGGAGGAGTTTGGAGTCGGGACCAACACCTTCTCTTAAACCTCCATGTG	430
	CATATCTACACCCCTTCCCAAAACCTCAGCGCTGTTTGTGGAAGAAATTTGGACCTACAC	
	I D V S K E F G V A T N F P F K P P C V	
481	TGTCCTCTACAGATGTGGGGGTTGTCTGCATATAGTGAGGGGCTGTCAGTGCATGAACACCA	540
	ACAGGCAGATGTCATACACCCCAACGACGTATATCATCTCCCGGACGTACGTACTTGTCTGT	
	S V Y R C G G C C N S E G L Q C M N T S	
541	GCACCGACTACCTCAAGAGACGCTATTGTGAATTTACAGTGGCTCTCTCTCAAGCCCCCA	600
	CGTGCCTCCATGGAGTCTCTCTGCAACAAACCTTTATATCTCACGGAGAGAGAGTCCCGGGGT	
	T S Y L S K T L F E I T V P I, S Q G P K	
601	AACCAATACCAATCAGTTTGTGCCAATCACACCTCTCCCGATGCAATCTCTAAACTGGATG	660
	TTGGTCAATTGTAGTCAAAACCGGTAGTGTGAAGGACCGCTACGTTACAGATTTTGACCTAC	
	P V T J S P A N H T S C R C M S K L D V	

2 / 68

## FIG. 1B

MATCH WITH FIG. 1C

## MATCH WITH FIG. 1B

66]	TTTACAGACAAAGTTCATTCCCATTAATTAGACGTTCCCTGCCAGCAGACACTACCCACAGTGTCTC	720
	AAATGTCTGTTCACAGTAAGGTAATAATCTGCAAGGGACGGTCTGTCTGTGATGGTGTACAG	
	Y R Q V H E I I R R S L P A T L P Q C Q	
72]	AGGCAGCGAACAAGACCTGCCCCACCAATTACATATGNGGAACTAAATCACATCTGCAGATGDC	780
	TCCGTCCCTTGTTCCTGGACGCGCGTGGTTAATATACACACCTTACTTACTAGTCTAGACGTCCTACGGB	
	A A N K C C P T N Y M W N N H I C R C L	
78]	TGGCTCAGGAAAGATTTCTATGTCTTCTCCGATGCTGAGATGACCTCAACAGATGGATTCCT	840
	ACCGAGTCTCTTCTTAAATAACAAAGAGGAGCCTACGACCTCTACTGAGTTGTCTACCTTAAGS	
	A Q E D F M F S S D A S D D S T D G F H	
84]	ATGACATCTGTGAGACCAACAAGGAGCTGGATGAGAGAGACCTGTCTAGTGTCTTGCAGAG	900
	TACTGTAGACACCTGATGTCTCTCCGACCTACTTCTCTGAGACAGTCTACACAGACGTCCTC	
	D I C S P N K E L D E E T C Q C V C R A	
90]	CGGGGCTTCGGCCTGCGCAGCTGTGGACCCCAAGAAGAACTAACAGAGAACTCATCCCACT	960
	GCCCCGAGACCGGACGGTCCGACACCTGGGGTCTTCTCTGATCTGTCTCTGAGTACCGTCA	
	G L R P A S C G P H K E L D R N S C C C	

FIG. 1C

MATCH WITH FIG. 1D

## MATCH WITH FIG. 1C

963	GTGTCGTGTAATAAACAACATCTCTCCAGGCCAATGTGGGGCCACCGAGAAATTGATGAATA	1020
	CACAGACATTTCTTGTTCAGAAAGGGTGGGTACACCCGGTTGCCCTCTTAAACTACTTT	
	V C K N K L F P S Q C G A M K E F D E N	
1021	ACACATGCCAGTGTCTGTATTAAGAACCCTGCCCTAGAAATCAACCCCTAATATCCTTSSAA	1080
	TGTTACGGTCACACACATACATTTCTTGGACGGGGTCTTTAGCTGGGATTTAGGACCTT	
	T C Q C V C K F T C P R N Q P L N P G K	
1031	AATGTGCTTGTGTAATGTACAGAAAGTCCACAGAAATGCTGTAAAGGGAAPCAAGTTCC	1140
	TTACACGGACACTTACATGCTTTTCAGGTCTCTTTACGAACTAATTTTCCCTTTCTTTCAAGG	
	C A C E C T E S P Q K C L L K G E K F H	
1141	ACCACCAAAACATGCAGCTGTTPACAGACGGCCCATGTACGAAACGGCCAGAGGCTTGTGAGC	1200
	TGGTGGTTTGTACGTGACAAATGTCTGGCCGGTACATGCTTGGGGTCTTCCGAACACTCC	
	H Q T C S C Y R R P C T N R Q K A C E P	
1201	CAGGATTTTTCATATAGTGAAGAGTGTCTCTTGTGTCTCCCTTTCATATTTGGCAAGACCCAC	1260
	GTCCCAAAAGTATATCATTCTTTCACACAGCAACACAGCGAAGTATACCGTTTTCGGTG	
	G P S Y S E E V C R C V P S Y W Q R P Q	

## FIG. 1D

MATCH WITH FIG. 1E

**MATCH WITH FIG. 1D**

1371

[illegible]

MS

[32]

TSECTACAGTAGAACTGTCTGTGAACAGAGAGACCCCTCTGTGGGTCCATGCTAACCAAGACAC  
 ---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+  
 ACCGTGTCATCTGTGACAGACACTTGTCTCTCTGGGAACACCCAGGTACGATTGTTTCTGTGT

1381

AAAGTCCTGTCTTCTCCGAAACCATGTCGATTAACCTTTACAGAAATGGACTCGAGGCTCAACTG  
 TTTTCAGACAGAAAGGACTTGGTACACCTATTGAAATGTCCTTTACCTGACCTCCGAGTAGAC

1491

CAAAGGCCCTCTTGTAAAGACTGGTGTTCCTGCCAATATACCAAACAGCCAGATTTTCCTC  
 GTTTTCCGGAGAACATTTCTGACCCAAACACGGTTPACATGTTGTCTGGTTCCTTAAGGAG

1501

TTTGTGATTTCTTTTAAAGAAAGGACCTTATKTTATTTATTTCTTCTTAAAGAACTATTCGTTTCTGCG  
AAGCTCTTAAAGGAAATTTTCTTTTCTCTGATATTTTATATTAAGGTCGATTTTCTTATCTAACAAACACCG

1561

[illegible]

1621

GC AAAATATGTTTAAANNTAAAATAAGAAAAATTGGTAATTGAATAATTAATAAATAATAATA  
CGTGCTGATACAAATTTTTTATGTTCCTTTTAAACAATAATTTGTTTCTGTTTCTTTTCTTTTCTTT

**FIG. 1E**

```

3      CGAGGCCACCGGCTTATGCAAGCAAGATCTGGAGCAGCAGTTACGGTCTGTCTCCAGTGT
      -----

61     AGATGAACCTCATGACGTACTCTTACCAGAAATATTGGAAATGTACAAAGTGCAGCTAAG
      -----
           M T V L Y P E Y W K K Y K C Q L R

121    GAAAGGAGGCTGGCCACATAACAGAGAACAGGCCAACCTCACTCAAGGACAGAAAGAGAC
      -----
           K G G W Q H N R E Q A N L N S R T E E T

181    TATAAATTTGGCTGCCAGCACATTAATAATACAGAGATCTTGAAAGACATATGATAATGAGTG
      -----
           I K F A A A H Y N T E I L K S I D N E W

241    GAGAAAGACTCAATGGCATGCCACGGGAGGTGTGTATAGATGTGGGAAAGGAGTTTGGAGT
      -----
           R K T Q C M P R E V C I D V G K E F S V

301    CGGACAAACACCTTCTTAAACCTCCATGTGTGTGGTCTACAGATGTGGGGGTTGGCTG
      -----
           A T N T F F K P F C V S V Y R C G G C C

```

FIG. 2A

MATCH WITH FIG. 2B

## MATCH WITH FIG. 2A

421 CGAAATTACAGTGGCTCTCTCAAGGCCCCCAACAGTAACAAATAGTTTGGCCATCTCA  
 E I T V P L S Q G P K P V T I S F A N H  
  
 481 CACTTCCCTGGCCGATGCCTAAGCTGGACGTCTTACAGACCAAGTTCATTTCCATTACACAG  
 T S C R C M S K L D V Y R Q V H S I I R  
  
 541 ACGTTCCTGGCCAGCAACACTACCAACAGTGTACGGCAGCGAACAAGACCTGCCCCCAACAA  
 R S L P A T L P Q C Q A A N K T C P T N  
  
 601 TTACATGTGGAAATAACACATCTCCAGATGCTGTGGTTCAGGAAGATTTTATGTTCCTTC  
 Y M W N N H J C R C L A Q E D F M F S S  
  
 661 CGATGCTGGAGATGACTCAACACATGEGATTCCATGACATCTGTGGACCAACAACGAGCT  
 D A G D D S C D G F H D I C G P N K E L  
  
 721 GGAATCAAGAGACCTGTCAGTGTGTCTGACAGCGGGGCTTCCGGCTGCCAGCTGTCCACC  
 D B E T C C Q C V C E A G I, R P A S C G F

MATCH WITH FIG. 2C

## FIG. 2B

## MATCH WITH FIG. 2B

```

781  CCACAAAGAACTAGACNGAACTCATGCCACTGCTGTCNTFAAAACAACACTCTTCCCCAG
      H K E L D R N S C C Q C V C K N K L F F S

841  CCAATCTGGGGCCCAACCGAGAAATTGATGAAPACACATGCCCACTGTATGTAAAAAGAPC
      Q C G A N R E F D E H T C C Q C V C K R T

901  CTGCCCCAGAAATCAACCCCTAANTCCCTGGAAAAATGTGCCCTGTGAATGTACAGAAAGTCC
      C P R N Q F L N P G K C A C E C T E S P

961  ACAGAAACGCTTGTTPAAGGAAAGAAGTTCCACCACCAACATGCCAGCTGTACAGACG
      Q K C L L E G K K F H H Q T C S C Y R R

1021 GCCATGTACGAAACCCGAGAGGCTTGTGAGCCAGGATTCTCATATACCTGAAGAACTGTG
      P C T N R Q K A C E P G P S Y S E V C

1081 TCGTTGTGTTCCCTTCATATGCGCAAGAGACCAACAAATGAGCTAAGATTGTACTGTATTCCA
      R C V P S Y W Q R P Q M S

```

MATCH WITH FIG. 2D

## FIG. 2C



## MATCH WITH FIG. 2C

```

1141 GTTCATCGAATTTCTACTATATGGAAAACTGTGTTGCCACAGTAGAACTGTC TGIGAACAGA
-----+-----+-----+-----+-----+-----+-----+-----+-----+
1201 GAGACCCCTGTGTTGGTCCATGCTTACAAAGACAAAAGTCTGTCTTCCCTGAAACCATGTGGA
-----+-----+-----+-----+-----+-----+-----+-----+-----+
1261 TAACTTTACAGAAATGERTGGAGCTCATCTGCAAAAGGCCCTTTGTAAAGACTGGGTTT
-----+-----+-----+-----+-----+-----+-----+-----+-----+
1321 CTGGCCAAATGACCCAAACAGGCCAAGATCTCTCCCTCTGTGATTTCTTTTAAAGAAATGACTATA
-----+-----+-----+-----+-----+-----+-----+-----+-----+
1381 TAAATCTGATTTCCCACTAAAAATATGTGTTTCTGCAATTCATTTTATAGCAACAACAATCGGT
-----+-----+-----+-----+-----+-----+-----+-----+-----+
1441 AAAACTCACTGTGATCAATATTTTATATATCATGCAAAATATGTTTAAATTAATGAAAAA
-----+-----+-----+-----+-----+-----+-----+-----+-----+
1501 TTGTAATTAATAAAAAAATAAAAAA
-----+-----+-----+-----+-----+-----+-----+-----+-----+

```

FIG. 2D

1  
 50  
 Pdg1a MATHACILL LCCCYLAHVL ACEALPREV IERLARSQIH SIRDLORLLE  
 Pdg1b MNRCAWALFL SLCYLRVLS AEGDPICEI YENLSDFIR SFDDLORLLH  
 Veg1 MAFLL SWVWVSLALL LY.....LHAKWSQA  
 Veg12 MTV LYPEYWRMYK CO.....LRKGGWQHIN

51  
 100  
 Pdg1a IDSVCSESL DIS\_RAHGVH ATKHVPEKRP LPIRKRSI.....LEAVP  
 Pdg1b GGP\_GCEDGA ELDLHMTSRH SGCELES...LAGRRSLG SLTIACPAMI  
 Veg1 APMNE.....CGCG NHHEVWATMD VYQR.....  
 Veg12 REQANINSRT CETIKFAAH YNTCILKSID NEWRK.....

101  
 150  
 Pdg1a ANCKTRIVLY EIPRSQVDPT SANFLWPPC VEVWRCIGCC NTSSVQDPPS  
 Pdg1b ACCKTRITVF EISRRIDRT NANFLWPPC VEVQRCSGCC MNRNVQDPPS  
 Veg1 SYCHPIELLY DIFQYDPEI..EYHKKPSC VPLMRGCGCC NDCGLDPPS  
 Veg12 TQCPREVCIDVGKEFGVAT..NTFFKPPC VSVYRCGCGCC NSEGLDPPS

151  
 200  
 Pdg1a RVHHRSVKVA KVCYVRKKPK LKCVQRLEI HLCDAG.....AT.....  
 Pdg1b QVQLRPVQVR KIEIVRKKPI FKKATVLEL HLADG.....ETVAAARPVT  
 Veg1 CESVITMQIM RIK PH...QG QHIGEMSLD HNKCFRKK DRARCKKSV  
 Veg12 STSYLSKTLF EITVPLSQC PKPVTISFAN HTSQGJLSKL DVYRQVHSFI

FIG. 3A

```

201          1SLNPD YRELDIDMR          ..... CKHKFKHHH DKTKLKLTLG
Pdg1a          RSPGGSCQR AKTPQTRVTI RIVRVRRPPK          ..... VKARCLMPW SLTCPLP
Pdg1b          RSK          CKGQKIKRK KSRYSWSVY          ..... CLAQEDIMFS SDAGDPSIDG
Veg1          RRSLPATLPG CDAANKTCPT NYWNNHPCR          .....
Veg12          .....
251          .....
Pdg1a          .....
Pdg1b          .....
Veg1          ..... CGP          ..... CSF PRKHILFVDDP QTKKCSCKNT
Veg12          FHDICGPIKE LDELICQVC RAGLRPASCG PHKEL...DR HSCQCVCKNK
301          .....
Pdg1c          .....
Pdg1b          .....
Veg1          DSRCKARQ ILLNERICRC DKFRIR          .....
Veg12          LFPSQCGANR LTDEHICQC VCKRICPRND PLNPGKCADE CTLSPQKCLL
351          .....
Pdg1a          .....
Pdg1b          .....
Veg1          KKKKTHQIC SCYRRPCINR QKACLPFSY SEIVCRCPMS YWQRIDMS
Veg12          .....
398          .....

```

FIG. 3B

PERCENTAGE (%) OF AMINO ACID IDENTITIES BETWEEN  
EACH PAIR OF GENES IS SHOWN IN THE  
FOLLOWING TABLE

	PDGF $\alpha$	PDGF $\beta$	VEGF	VEGF-2
PDGF $\alpha$				
PDGF $\beta$	48.0			
VEGF	20.7	22.7		
VEGF-2	23.5	22.4	30.0	

FIG. 4

Expression of VEGF2 mRNA in  
Human Breast Tumor Cells

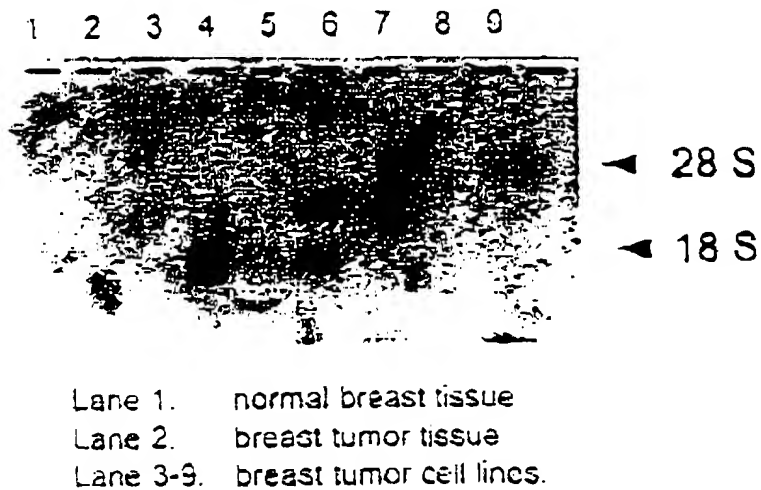


FIG. 5

## Expression of VEGF-2 mRNA in Human Adult Tissues

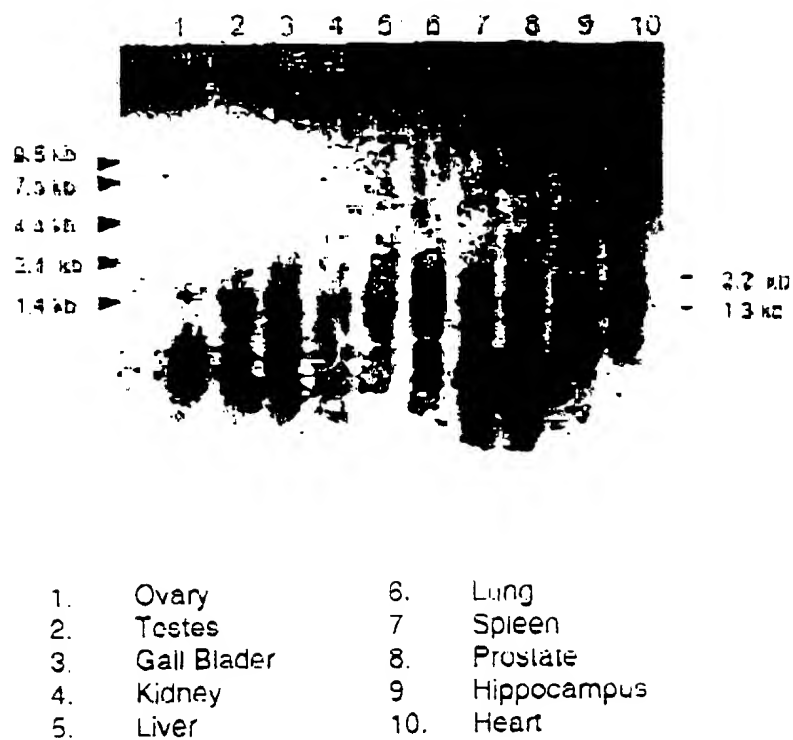
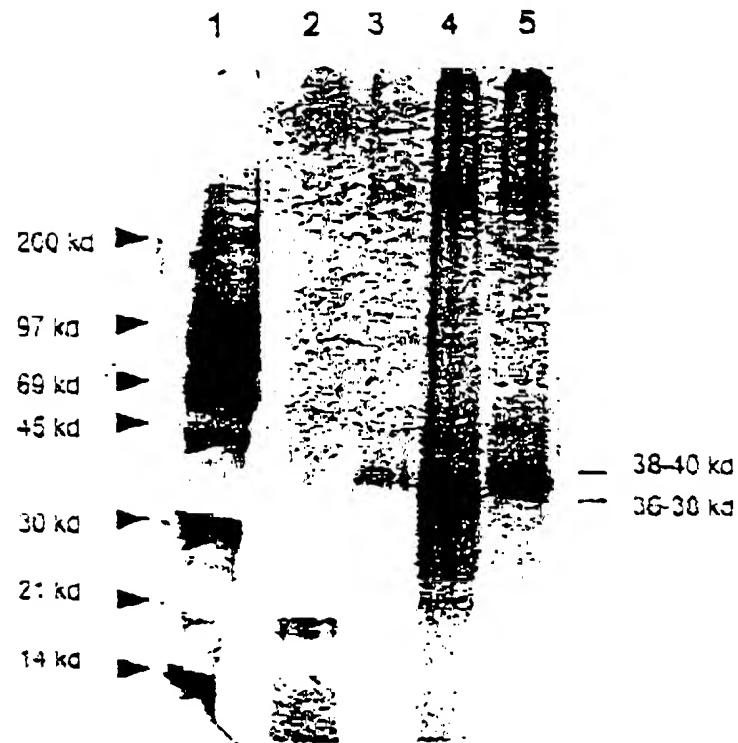
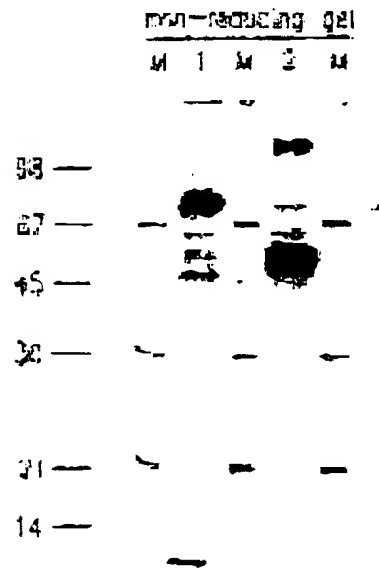


FIG. 6



Lane 1: 14-C and rainbow M.W. marker  
 Lane 2: FGF control  
 Lane 3: VEGF2 (M13-reverse & forward primer)  
 Lane 4: VEGF2 (M13-reverse & VEGF-F4 primer)  
 Lane 5: VEGF2 (M13-reverse & VEGF-F5 primer)

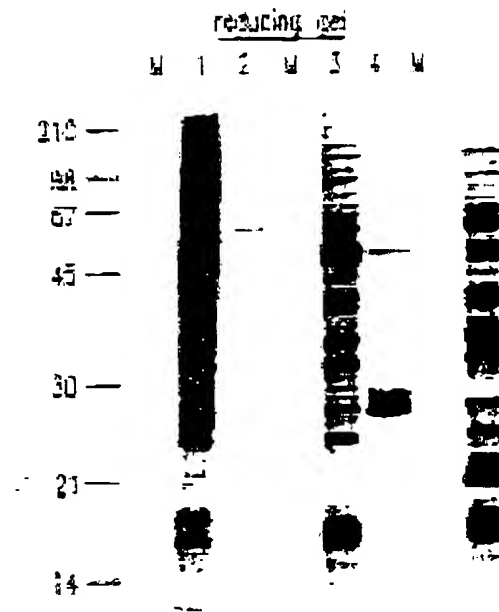
FIG. 7



Lane M: Marker  
 Lane 1: Vector medium  
 Lane 2: VEGF2 medium

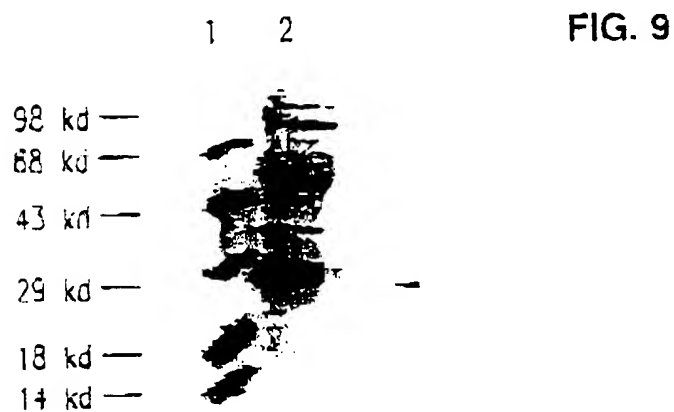
FIG. 8A



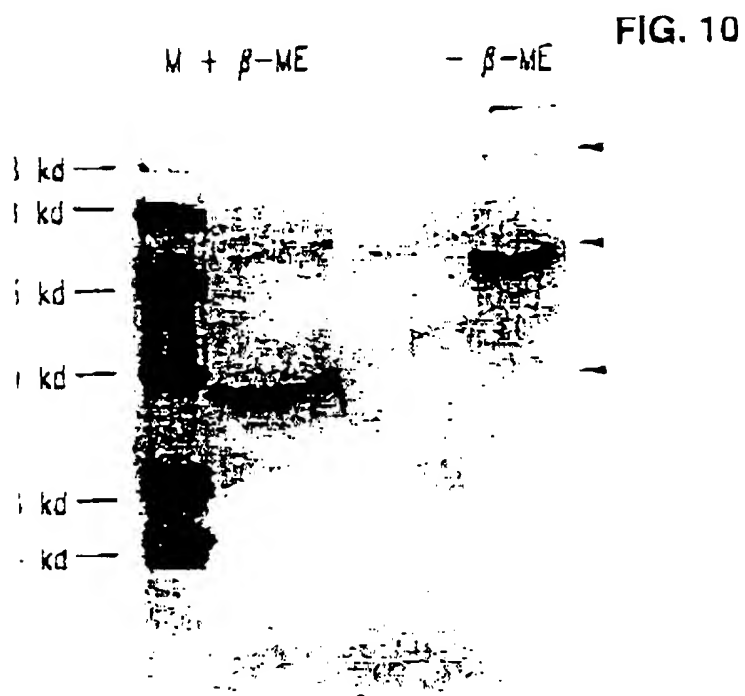


Lane M: Marker  
Lane 1: vector cytoplasm  
Lane 2: vector medium  
Lane 3: VEGF2 cytoplasm  
Lane 4: VEGF2 medium

FIG. 8B



Lane 1: Molecular weight marker  
Lane 2: Precipitates containing VEGF2.



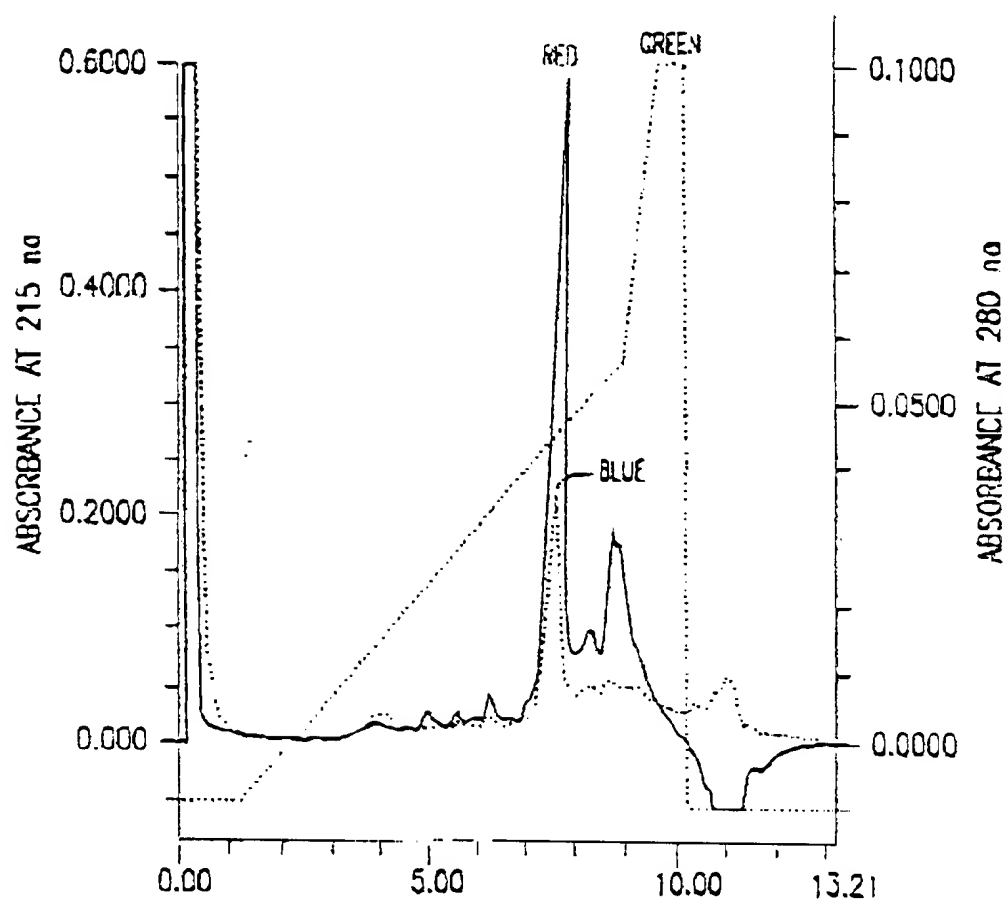


FIG. 11

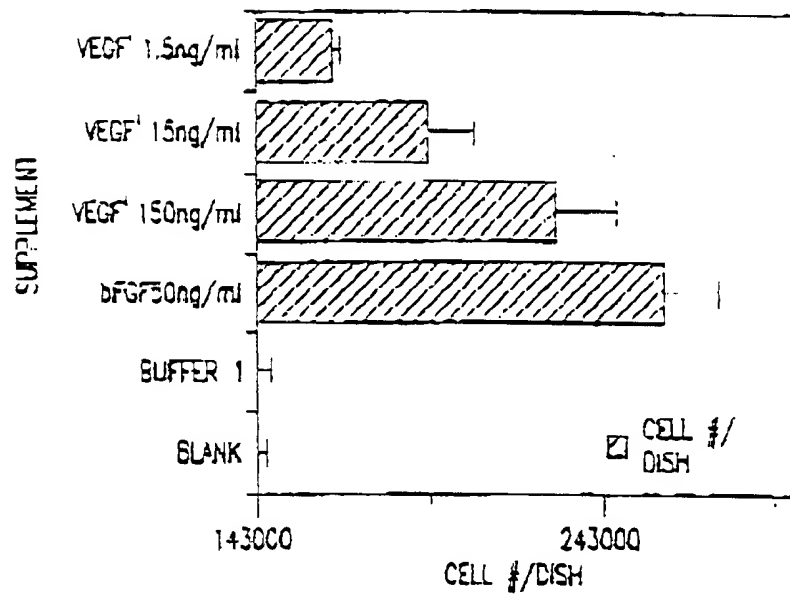


FIG. 12

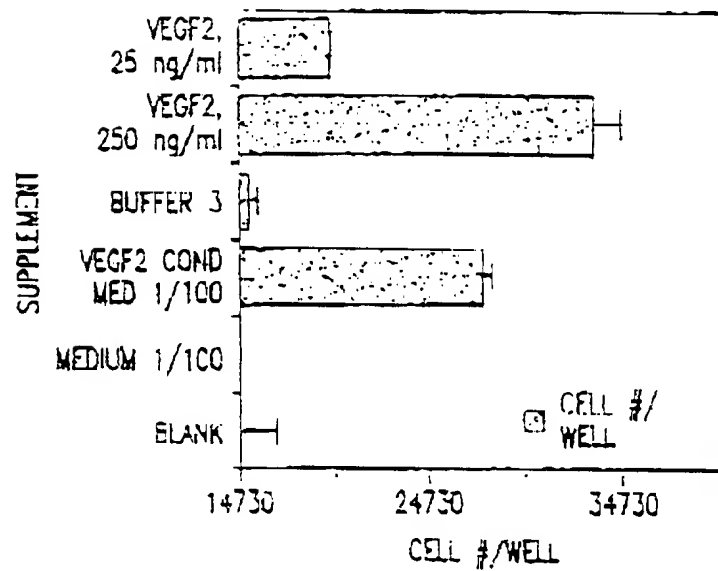


FIG. 13

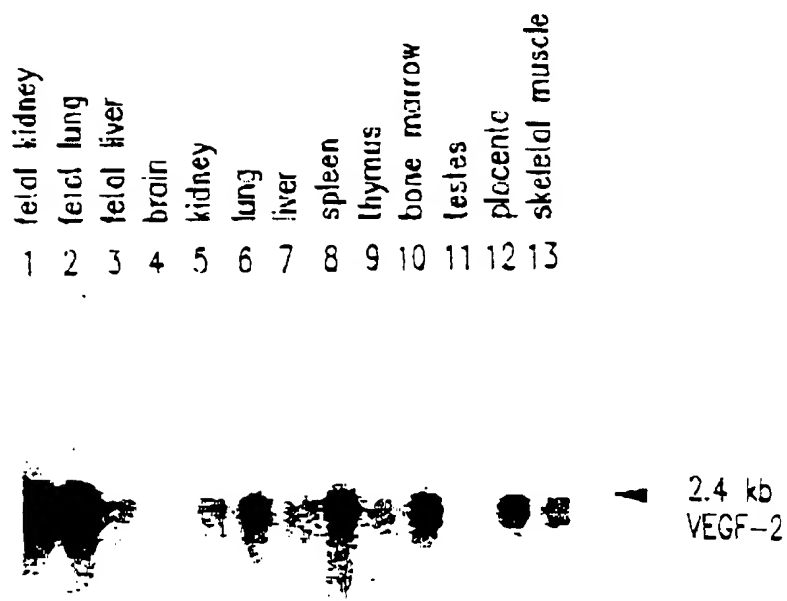


FIG. 14A

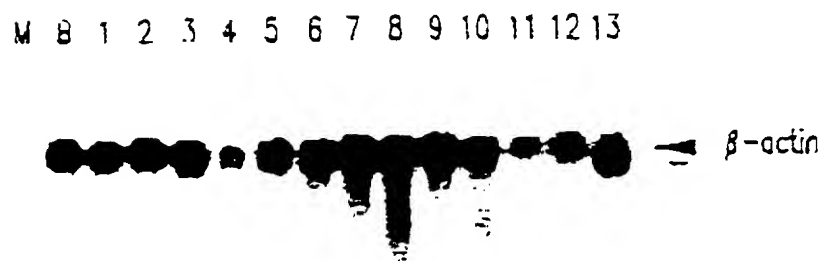
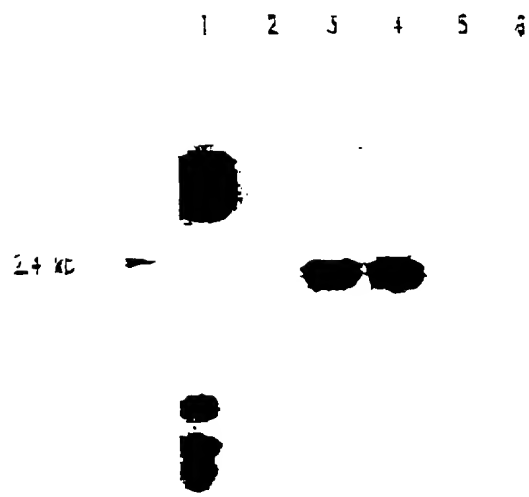


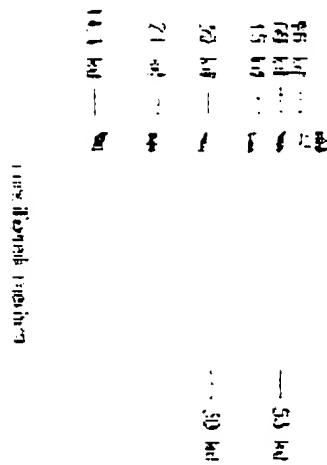
FIG. 14B

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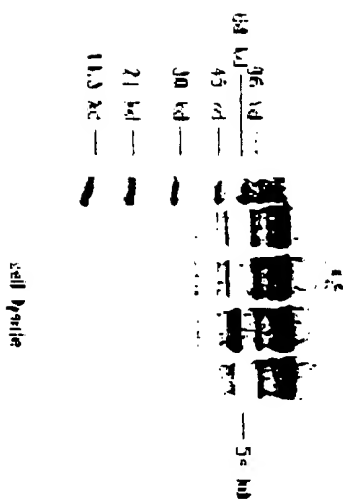
1. Molecular weight marker
2. Umbelical vein endothelial cells
3. Aortic smooth muscle cells
4. Dermal fibroblast

FIG. 15



1. Molecular weight marker
2. Blank
3. Control protein HA
4. Vector control
5. VEGF2-HA

FIG. 16A



1. Molecular weight marker
2. Blank
3. Control protein-HA
4. VEGF2-HA
5. Vector control

FIG. 16B

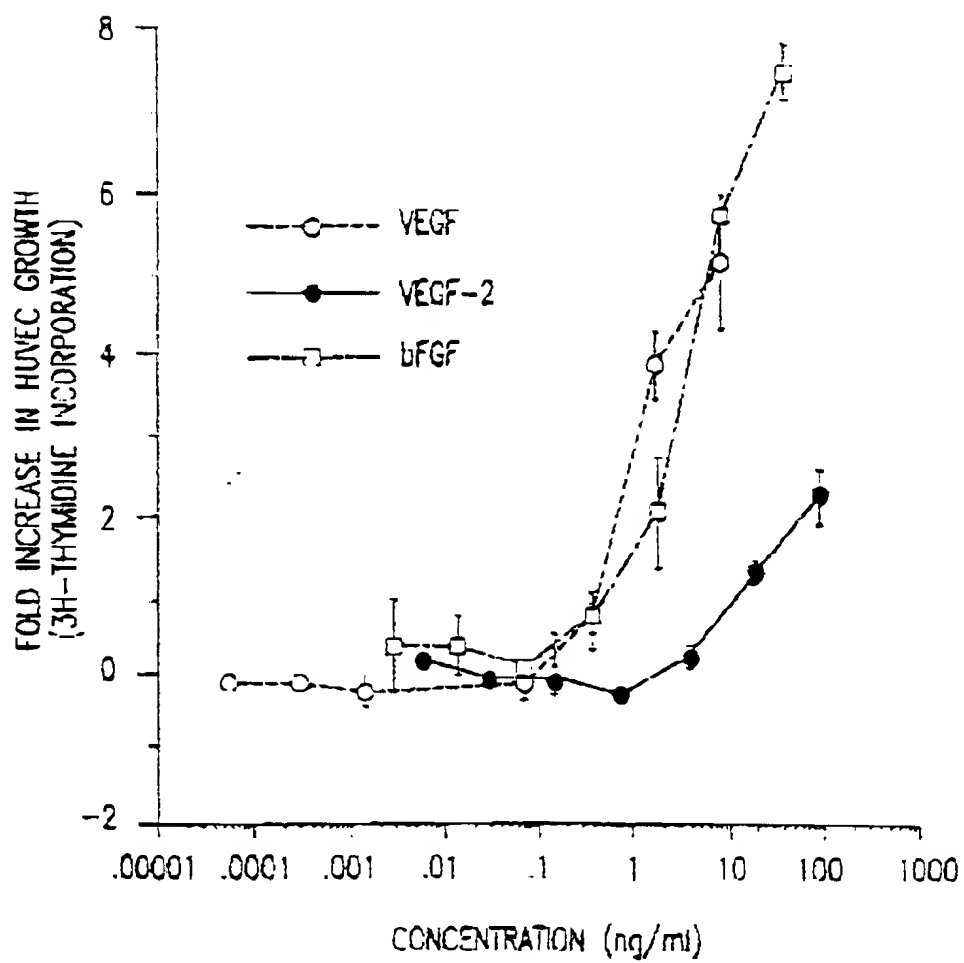


FIG. 17



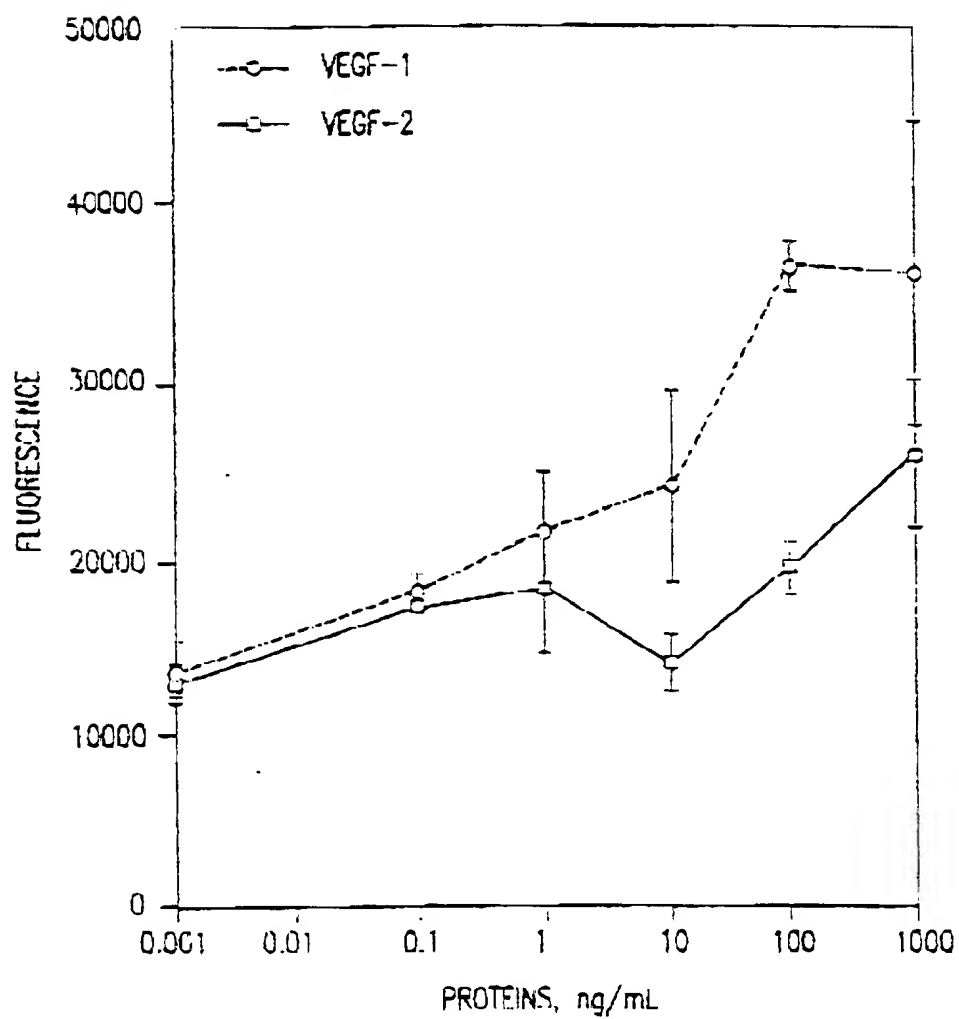


FIG. 18

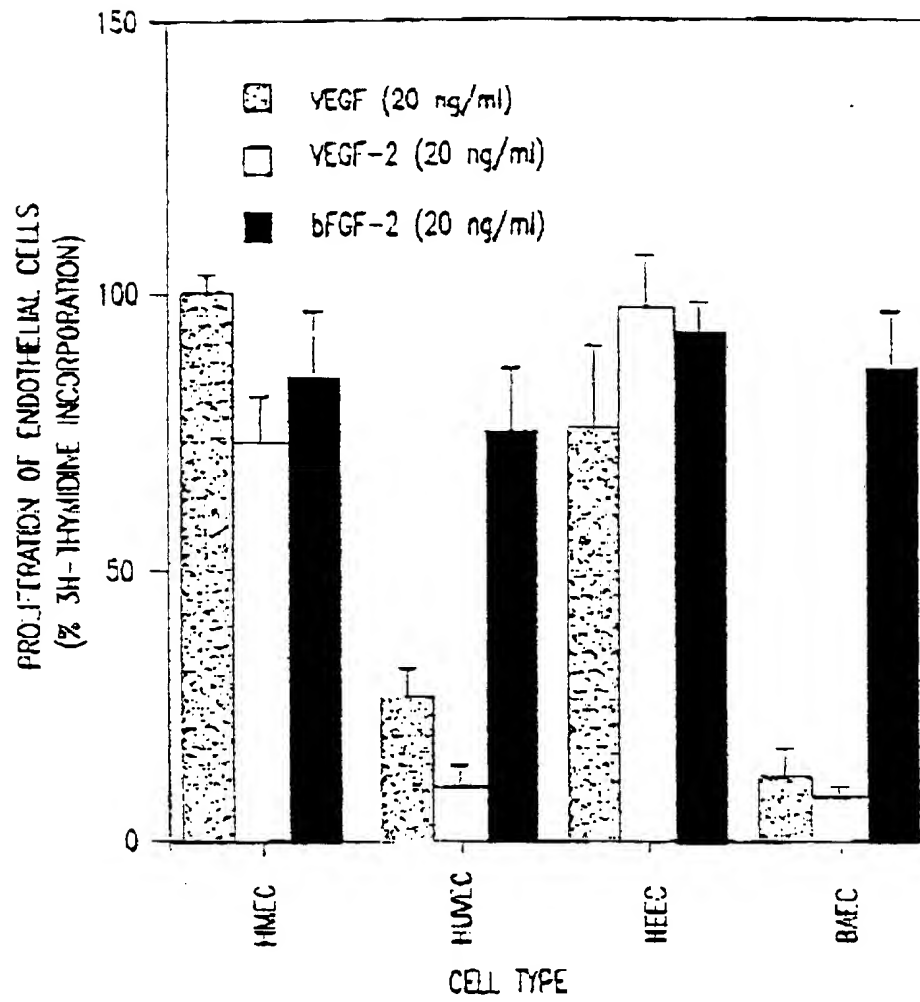


FIG. 19

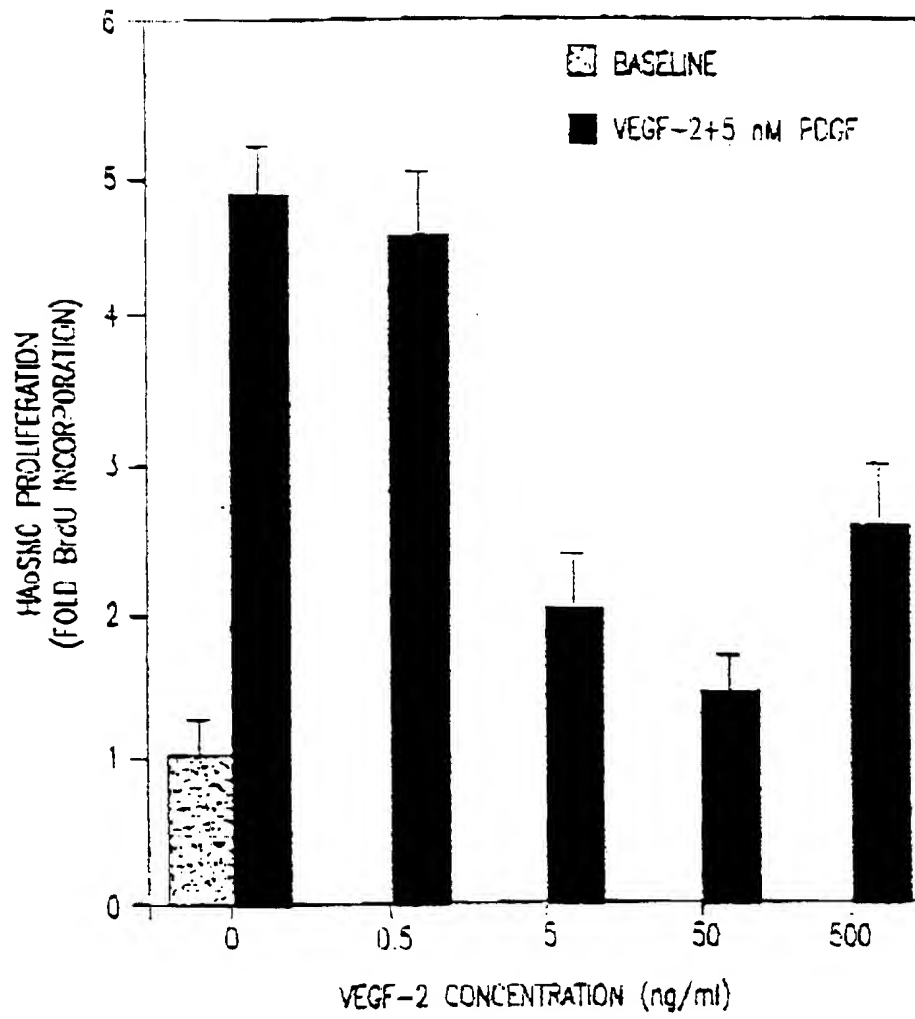


FIG. 20A

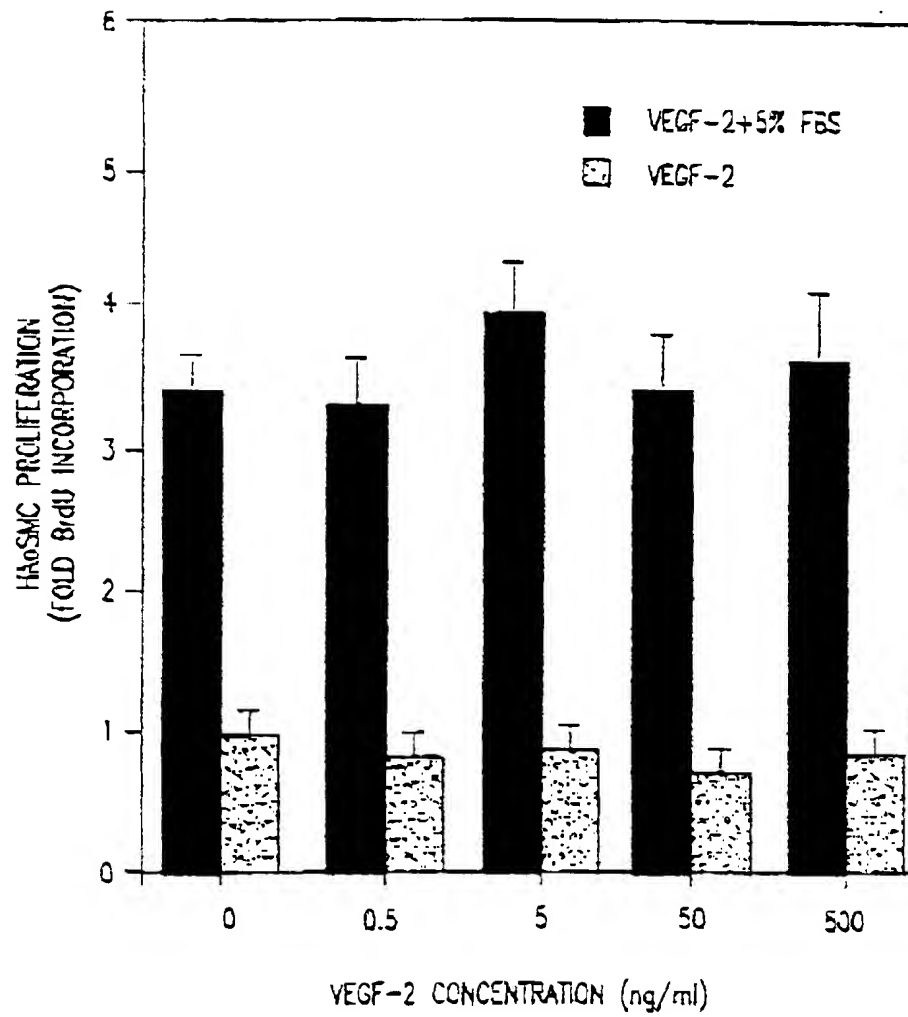


FIG. 20B

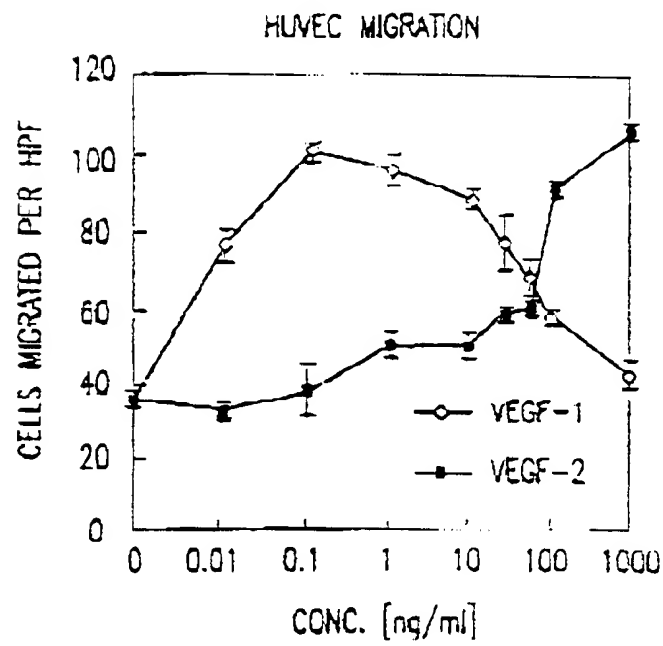


FIG. 21A

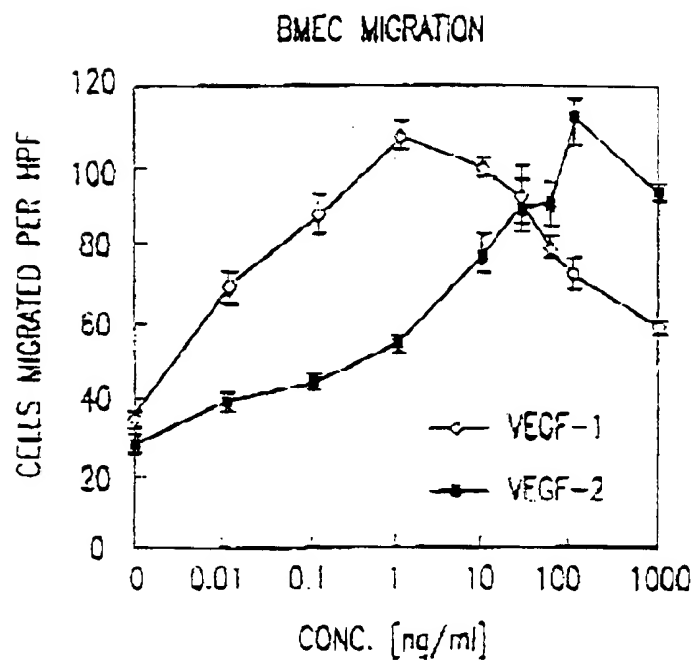


FIG. 21B

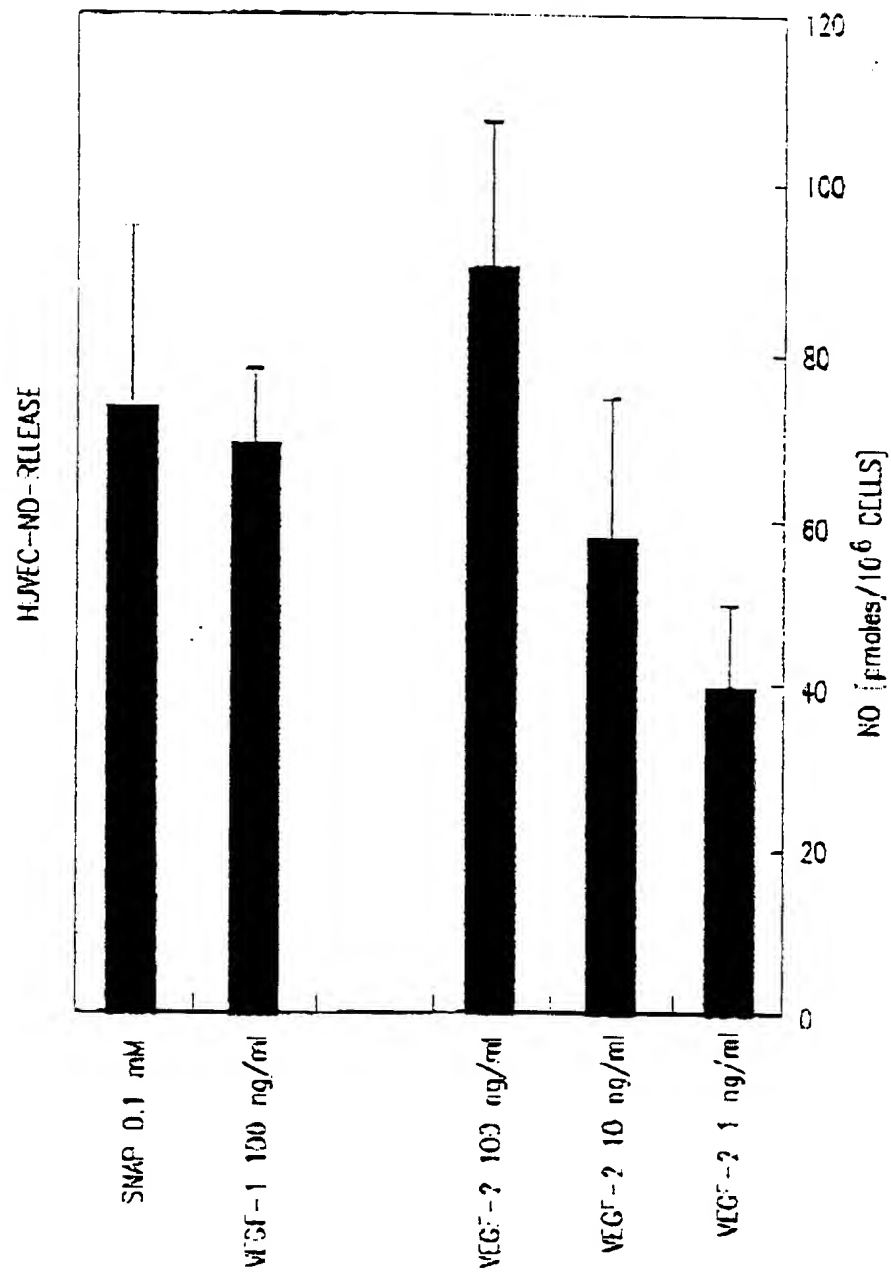


FIG. 22

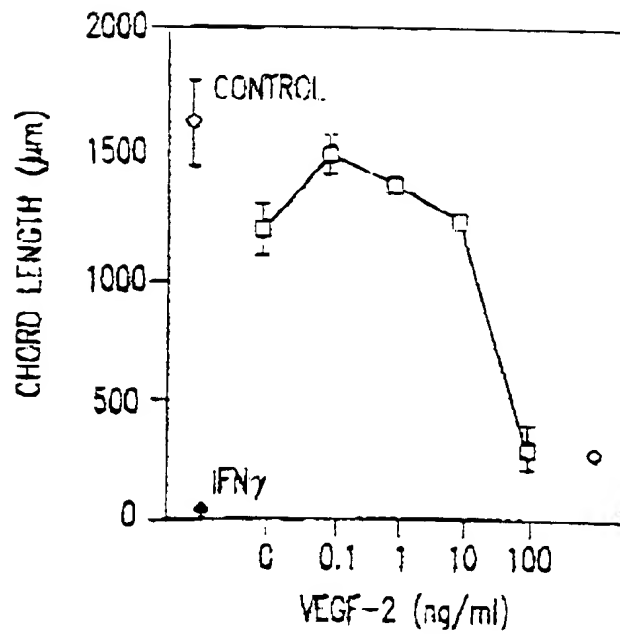


FIG. 23

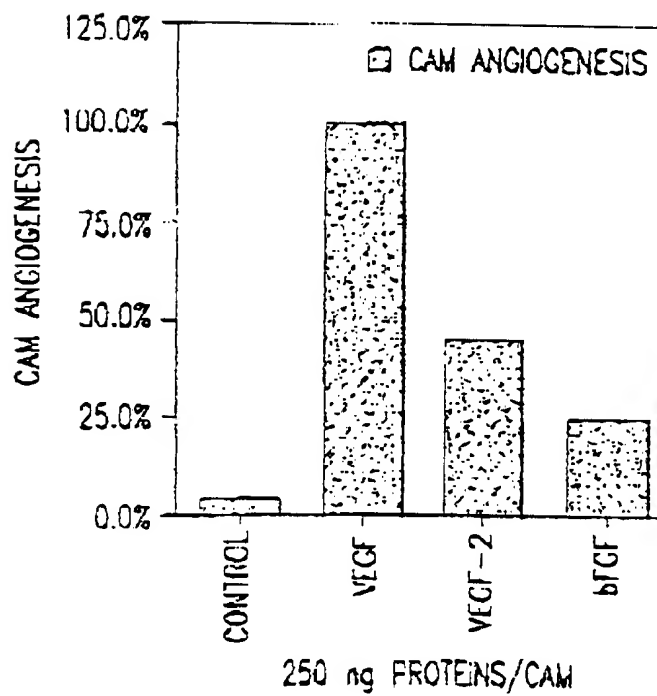


FIG. 24

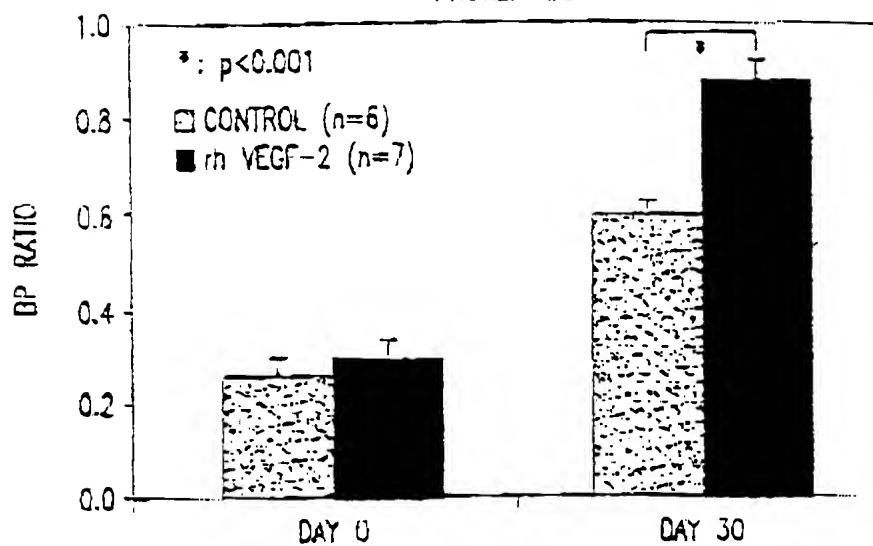
CALF BLOOD PRESSURE RATIO  
-PROTEIN LA-

FIG. 25A

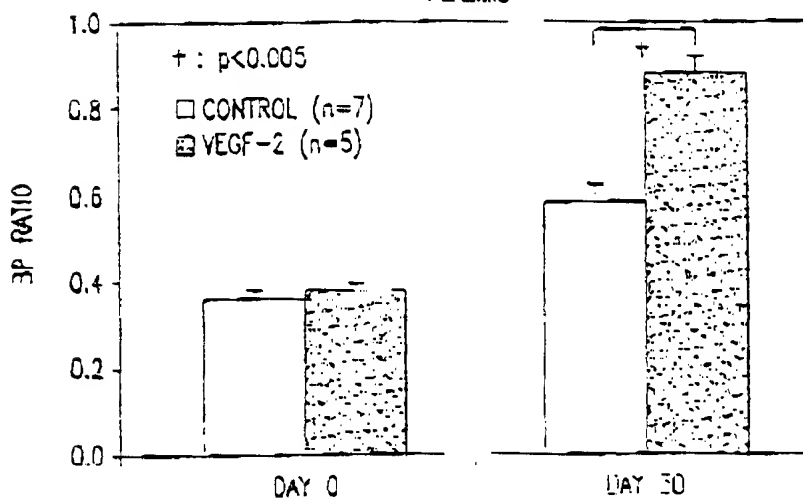
CALF BLOOD PRESSURE RATIO  
-PLASMID-

FIG. 25B



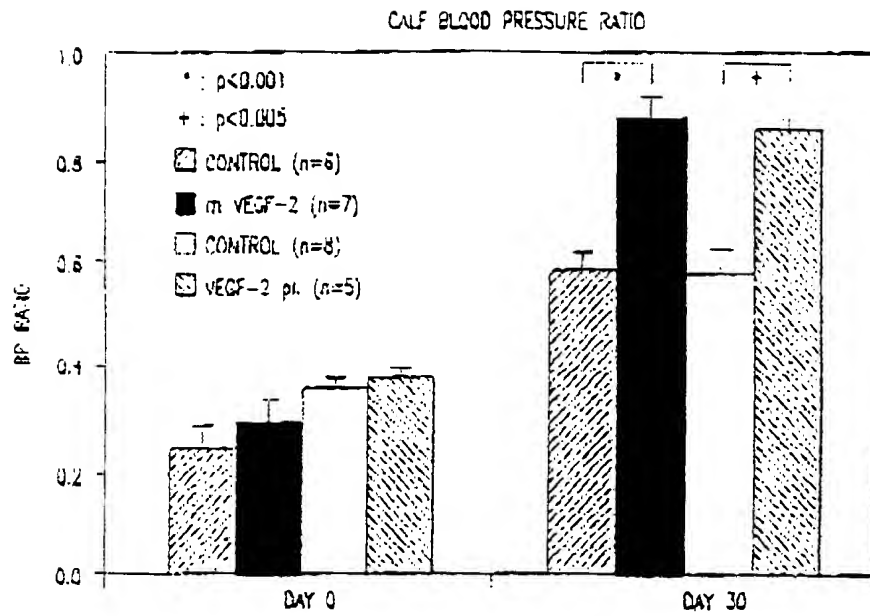


FIG. 25C

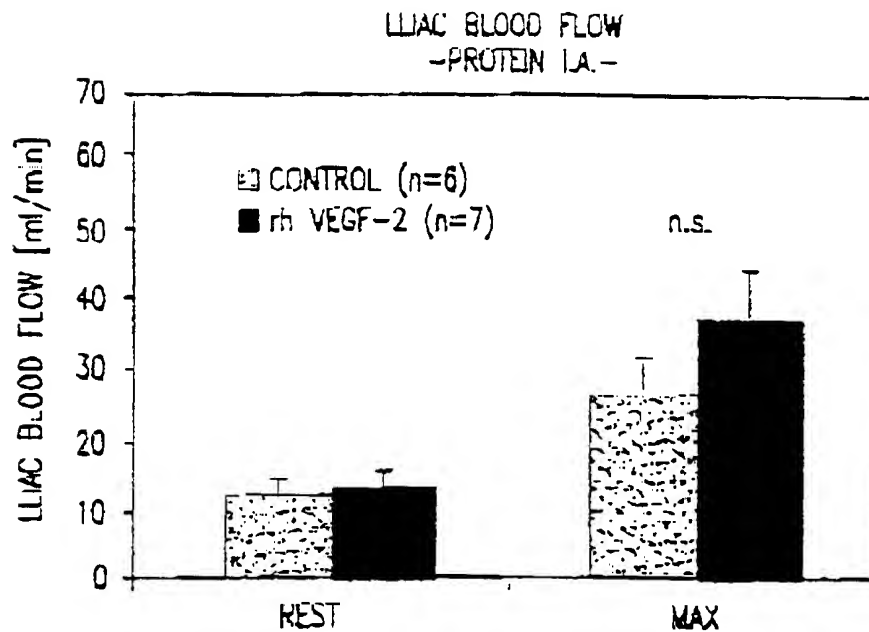


FIG. 25D

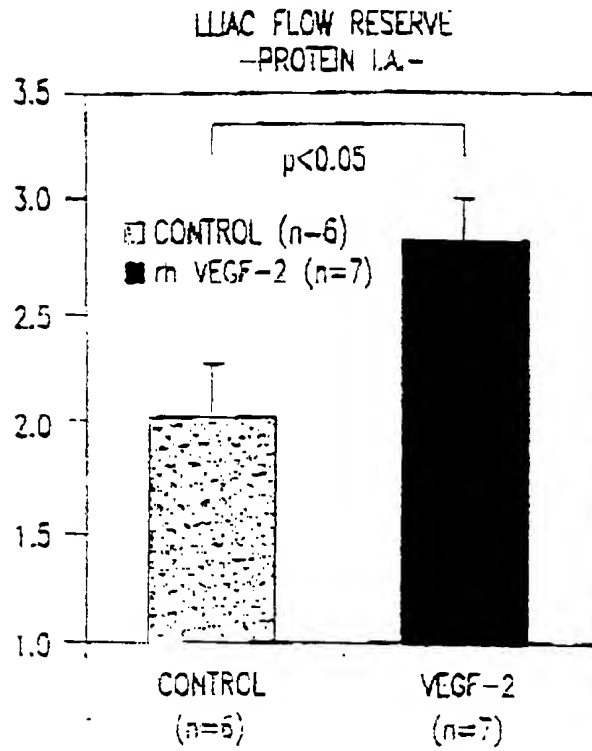


FIG. 25E

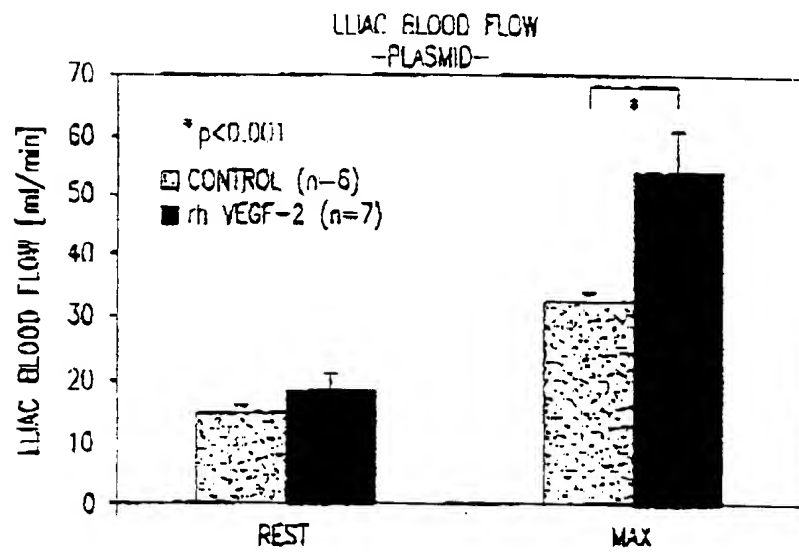


FIG. 25F

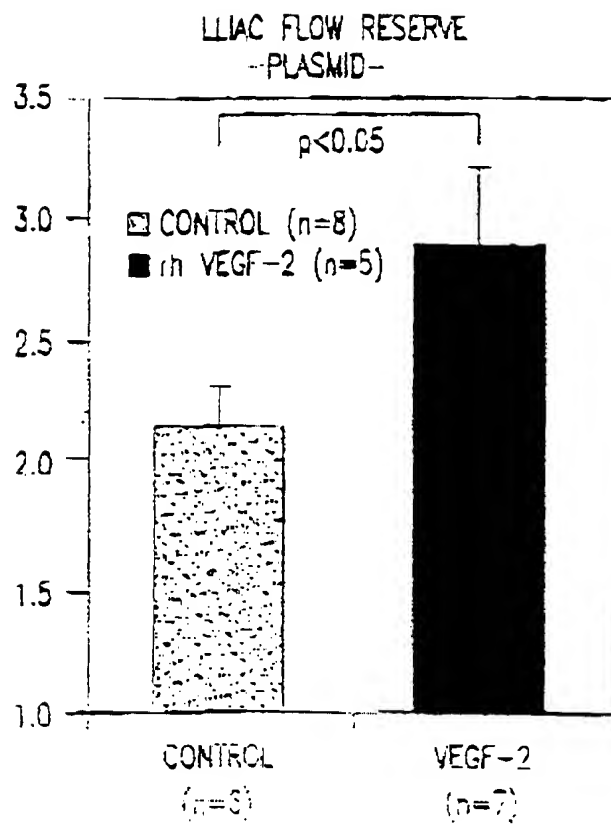


FIG. 25G

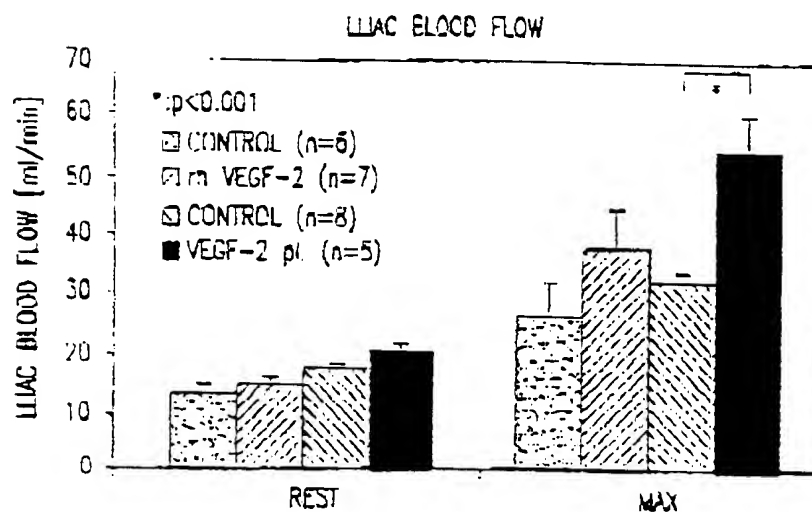


FIG. 25H

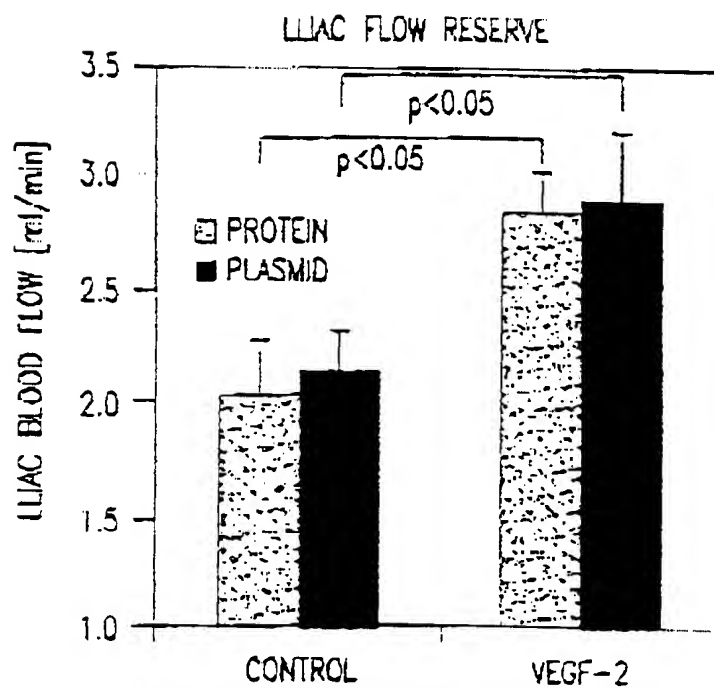


FIG. 25I

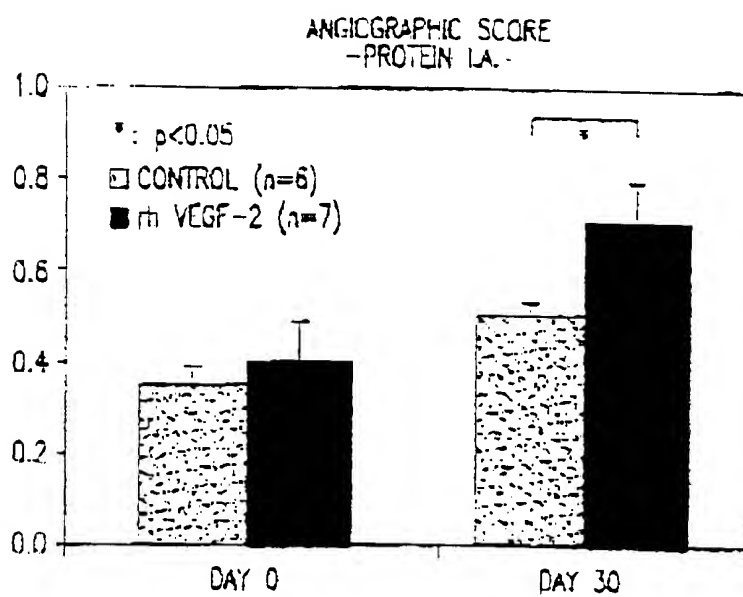


FIG. 25J

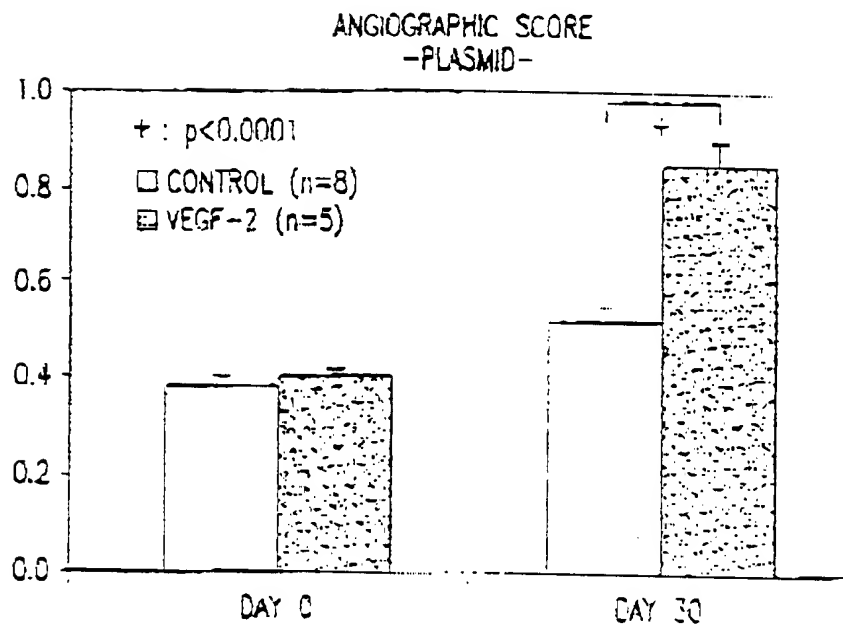


FIG. 25K

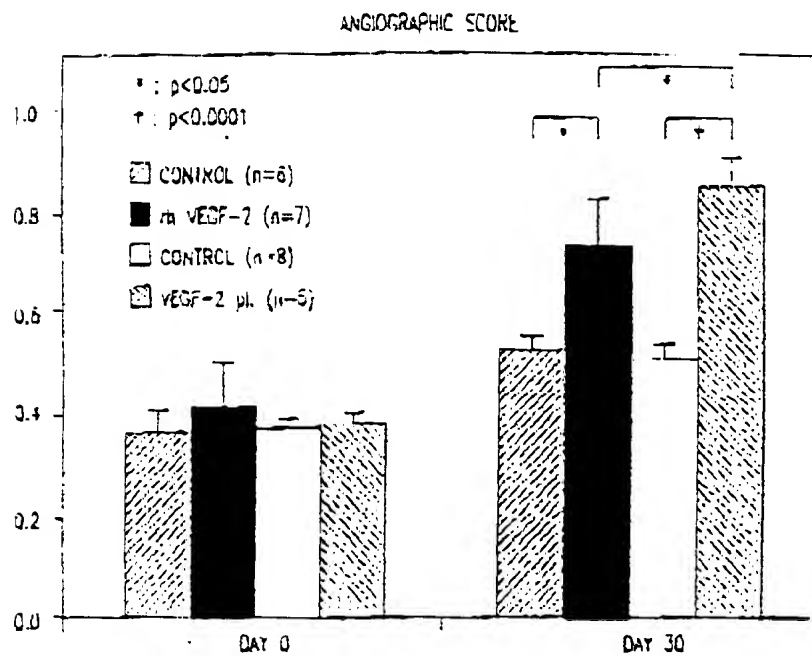


FIG. 25L

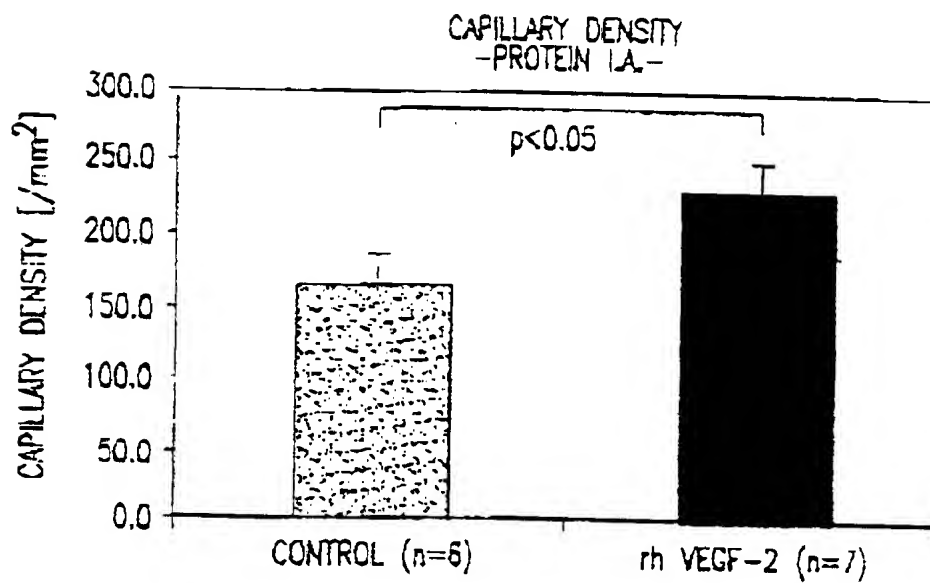


FIG. 25M

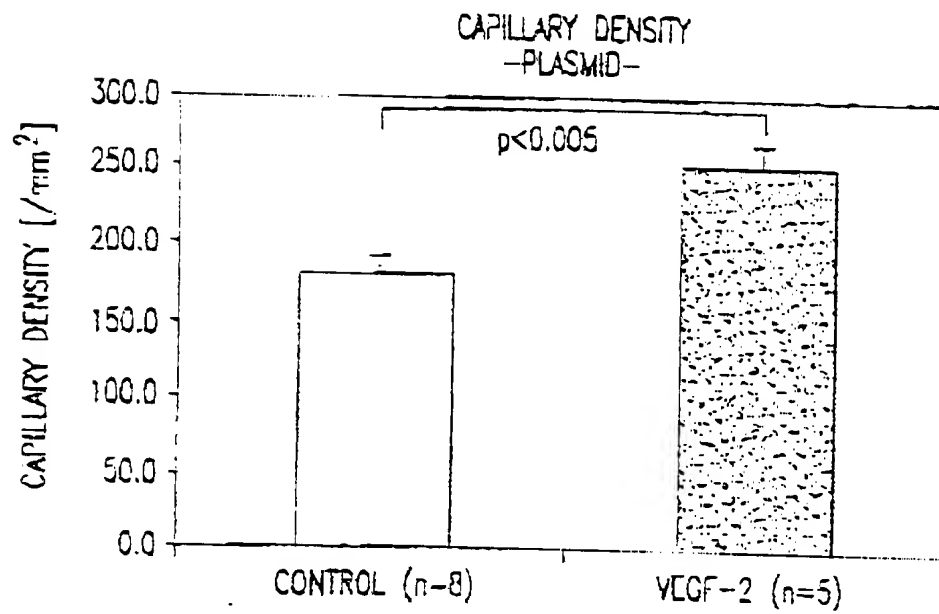


FIG. 25N

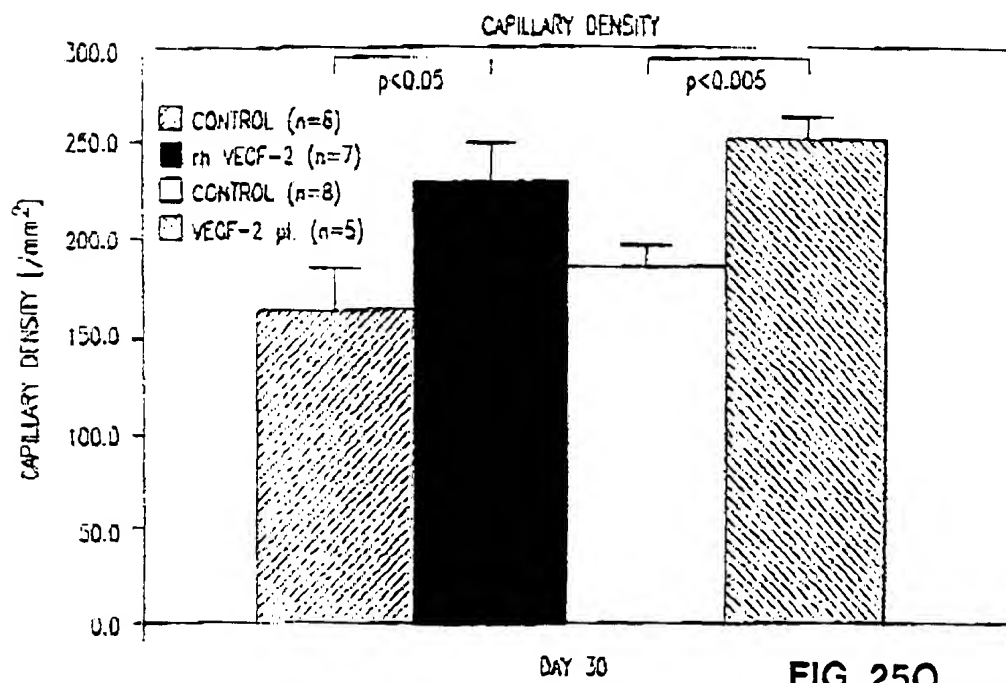


FIG. 25O

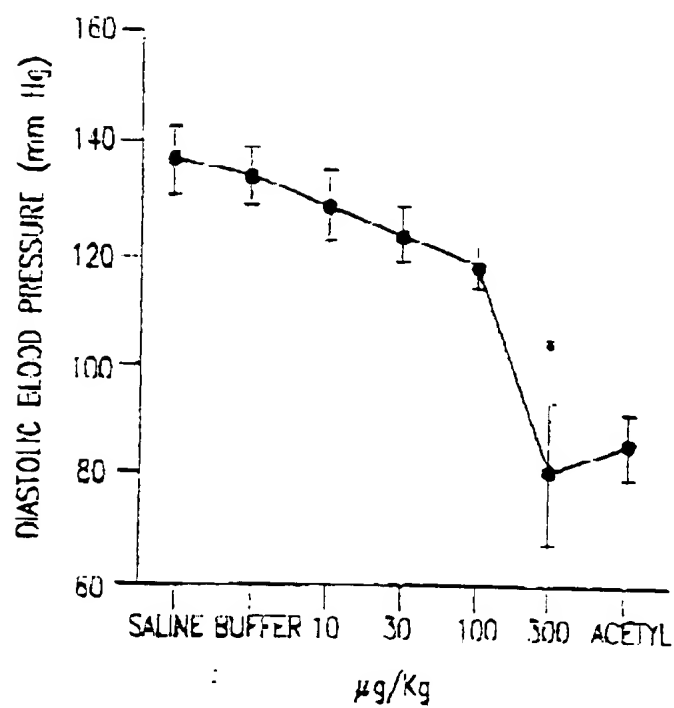


FIG. 26A

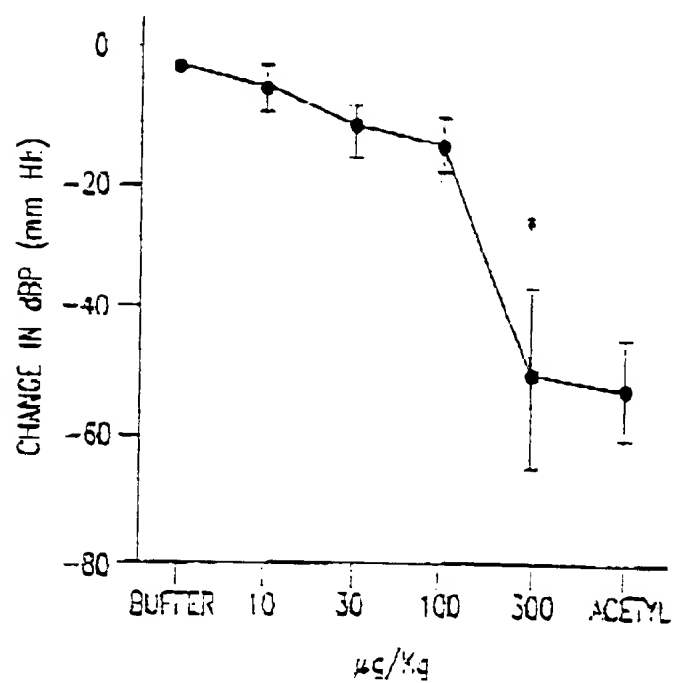


FIG. 26B



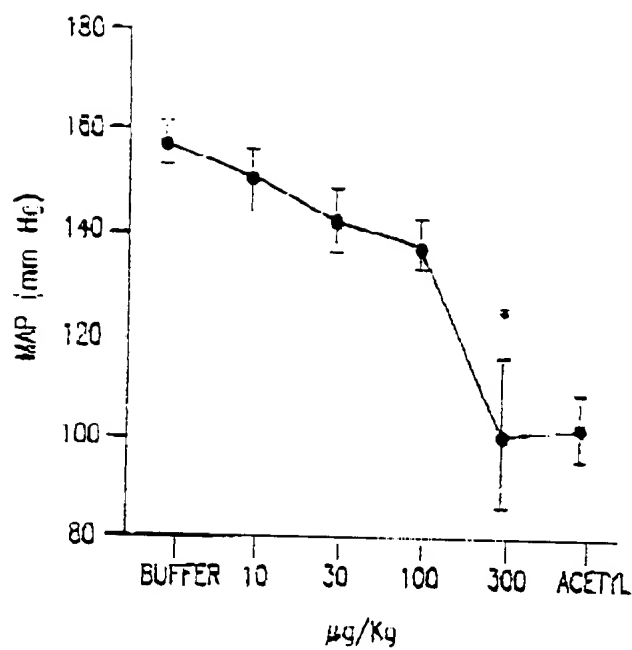


FIG. 26C

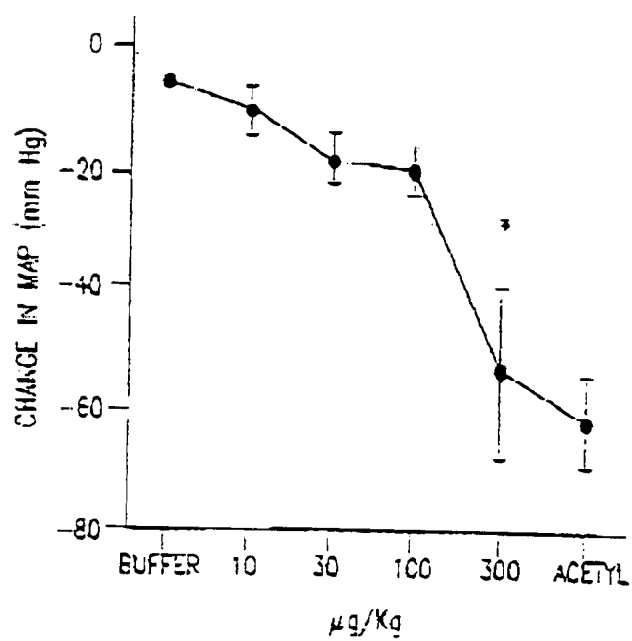


FIG. 26D

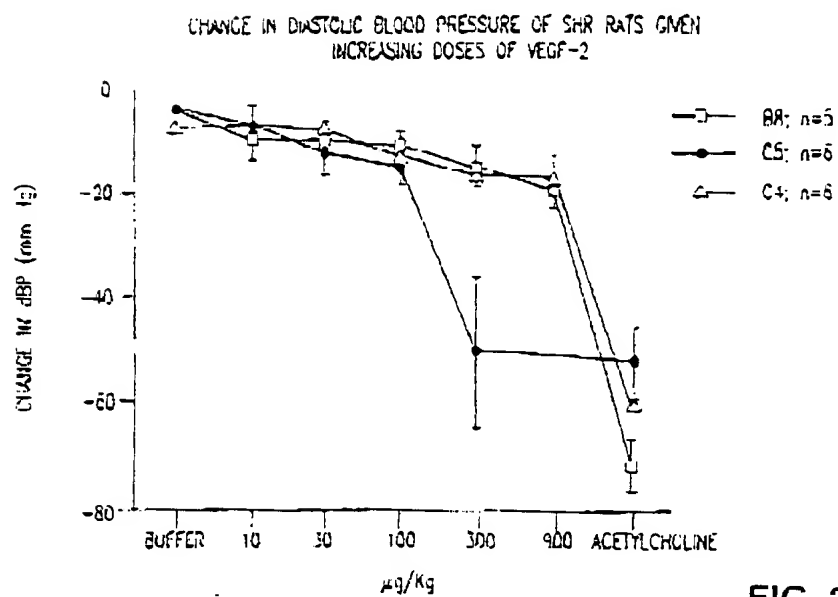


FIG. 26E

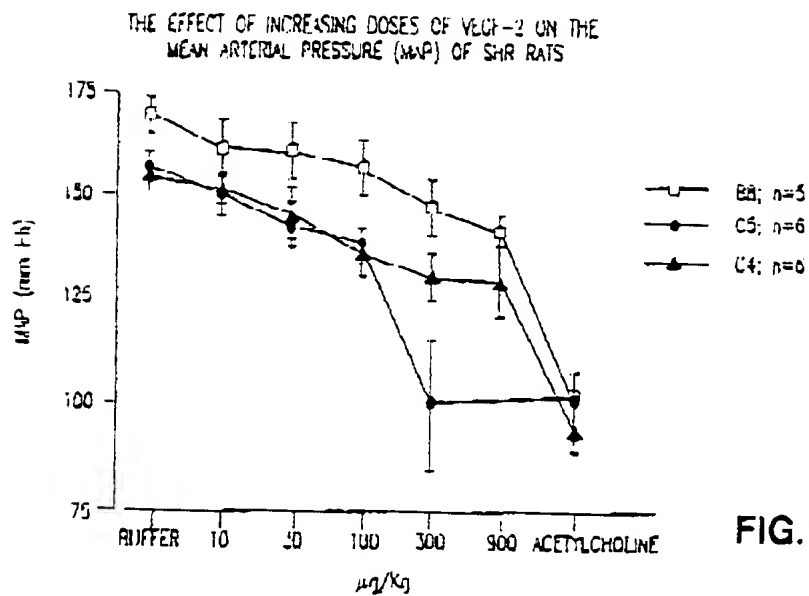


FIG. 26F

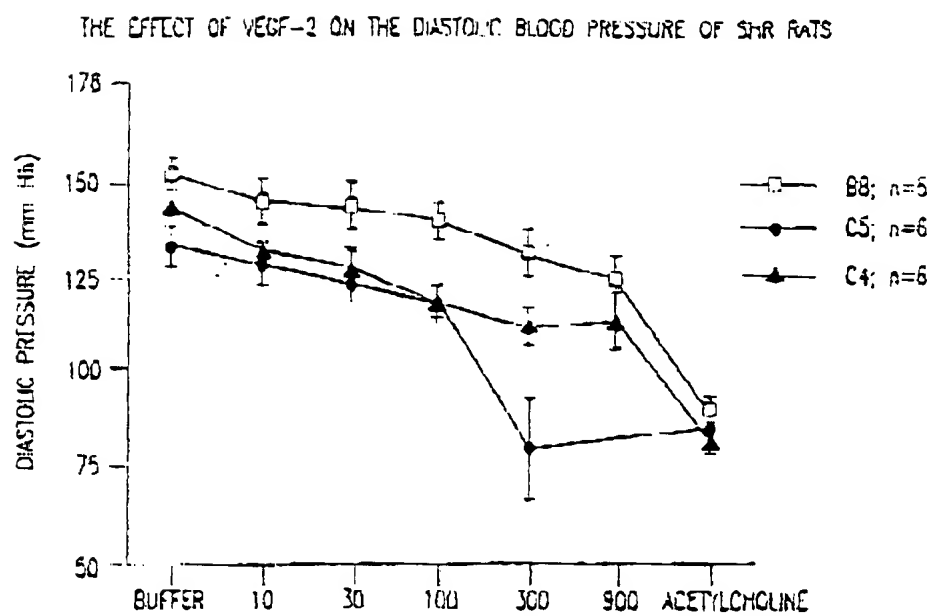


FIG. 26G

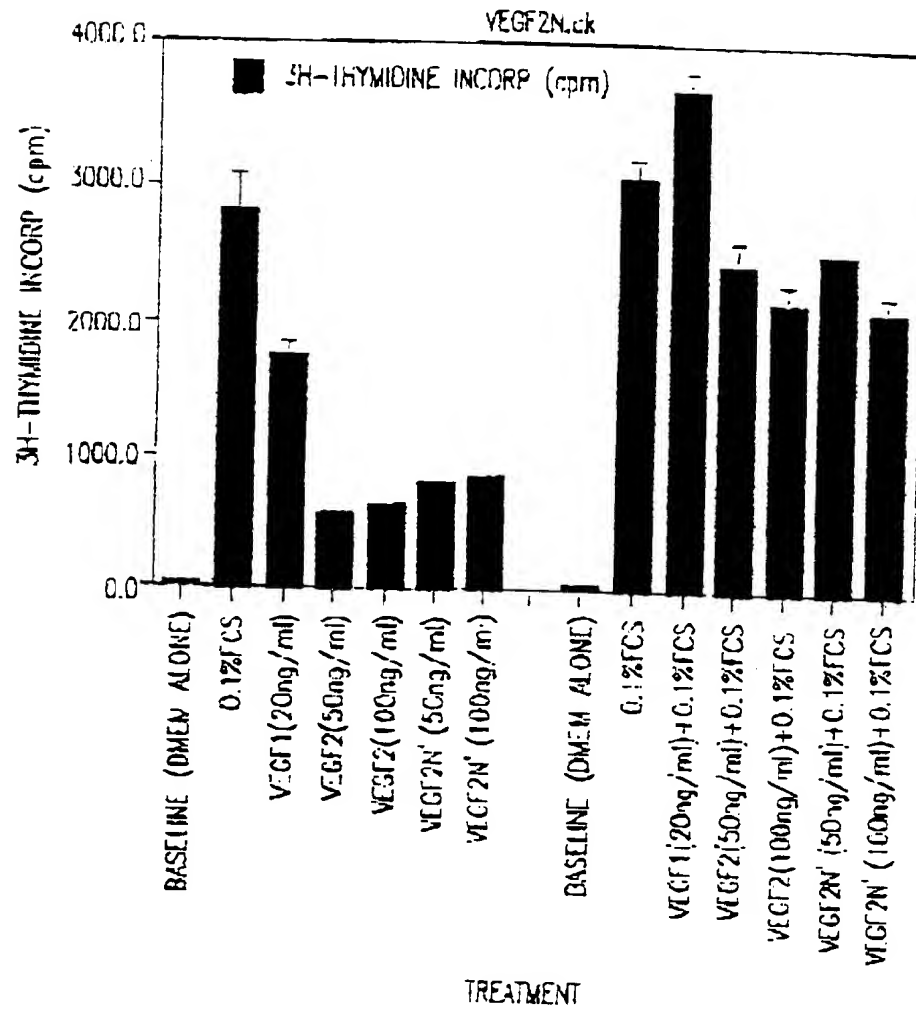


FIG. 27

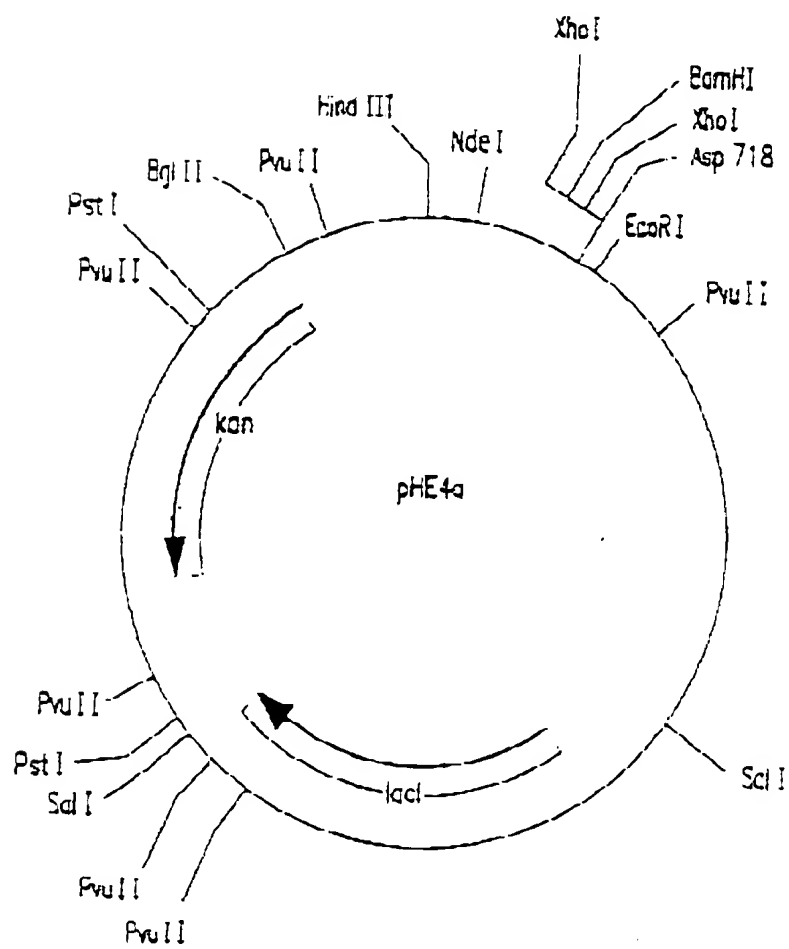


FIG. 28

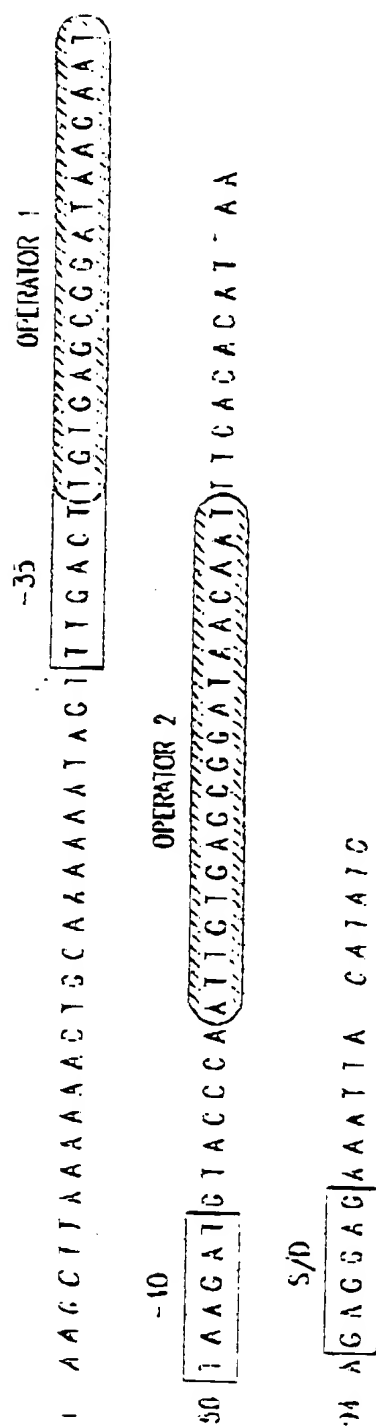


FIG. 29

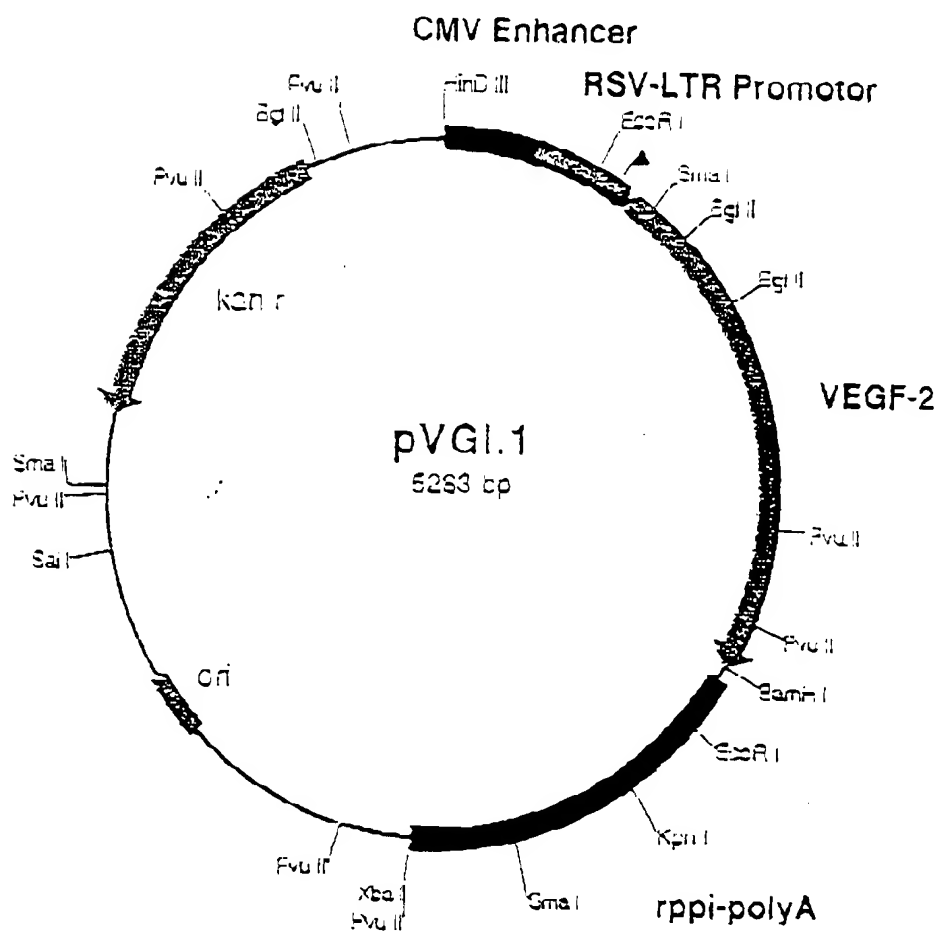


FIG. 30

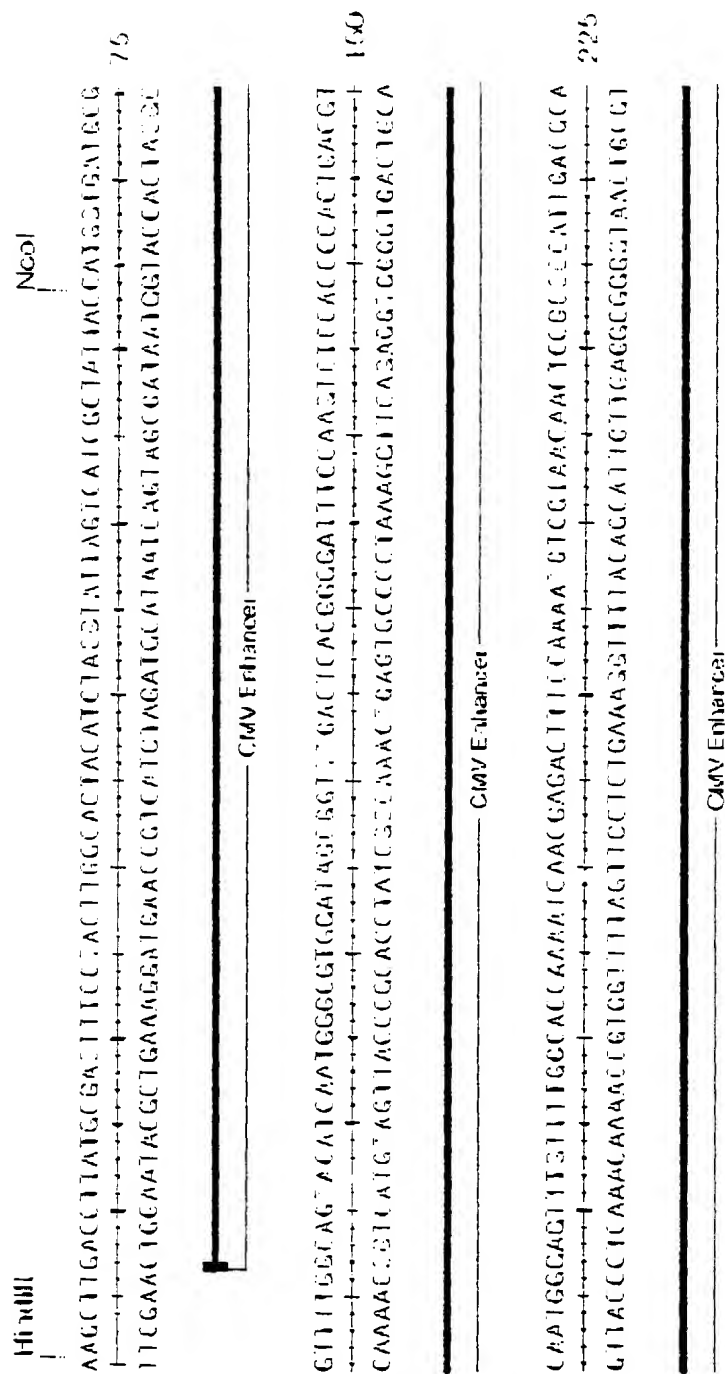


FIG.31A



AATGGGCGG'ACGGCGACATGCTTATGTAAGGGTGAGTTAGCAACATGCCCTTATAAAGGAGAGAAAGCAACGGTG  
 TTAACCGGTCATCCCGTGGTACGAATACATGCTACATCAATCGTGTACGGAATATCTCTCTTTTCCGCGGCA  
 300

---CMV Enhancer---  
 ---RSV LTR Promoter---

CATCCCGATGCTGCGAG' AAGGTGCTATGATCCGCTATGATCCGCTTCTTAGGAGAGGTAACAGACGGGCT  
 CTACGGCTAAGCAAGCTCA' TCCACCATACCTAGCAACATATAGCAAGGAAACAACTCTCCGTTCTTGTCCAGA  
 375

---RSV LTR Promoter---

AATACGGATGGACGAACCAATGAA' TCCGCAATCCAGAGATATGTAATTAAGTCCGAGCTCGATACAAATANA  
 TTG'GCCATACCTGCTTGGTCACTTAAGCGGTAACTCTCTCTATAAACAATANAATLCAACGGCTCGAGCTATGTTATTT  
 450

---RSV LTR Promoter---

FIG.31B

F S S I D I S D A E P O A G E A I A Y A S E D L F

FIG. 31C

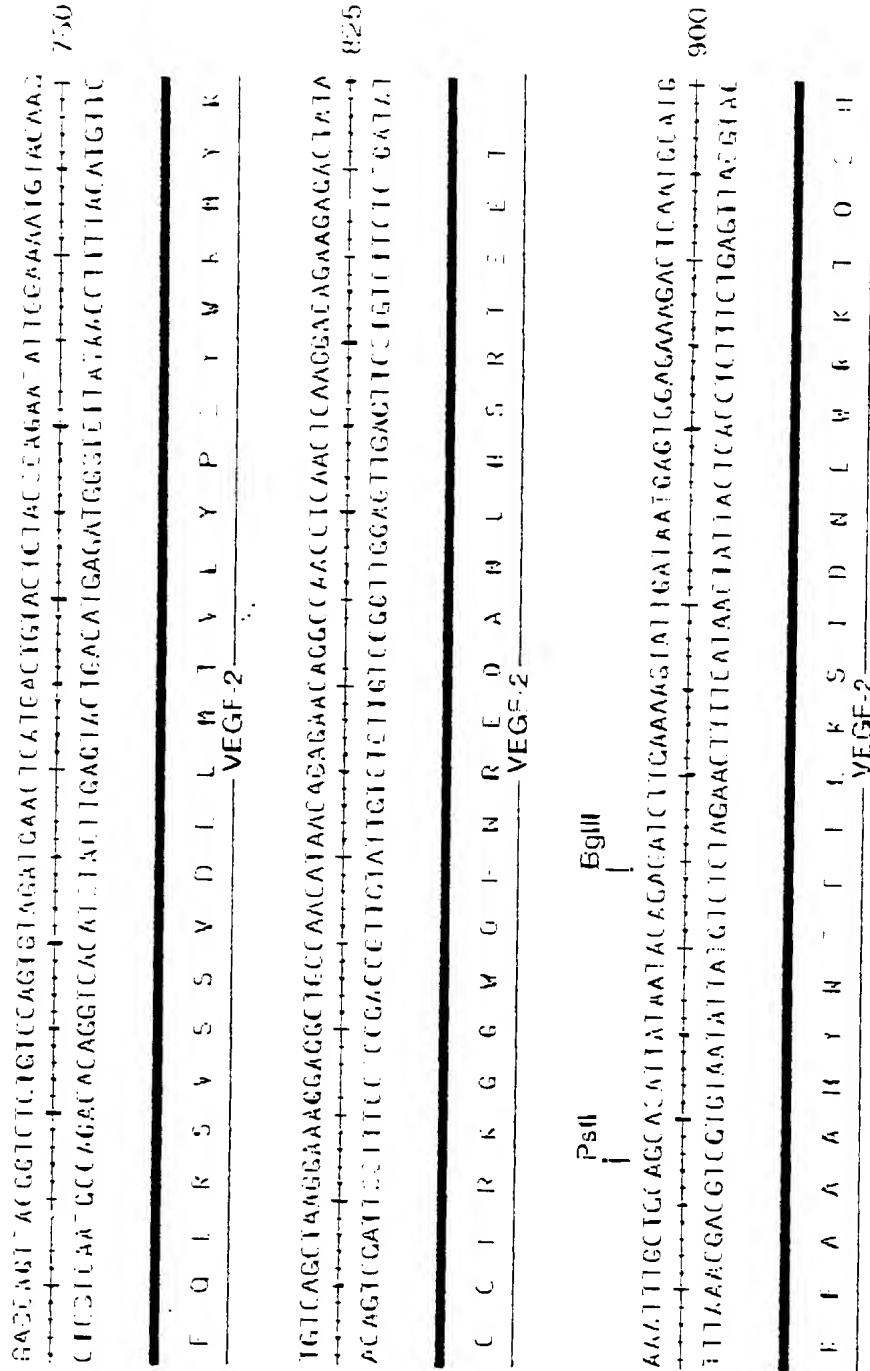


FIG.31D

**FIG. 31E**

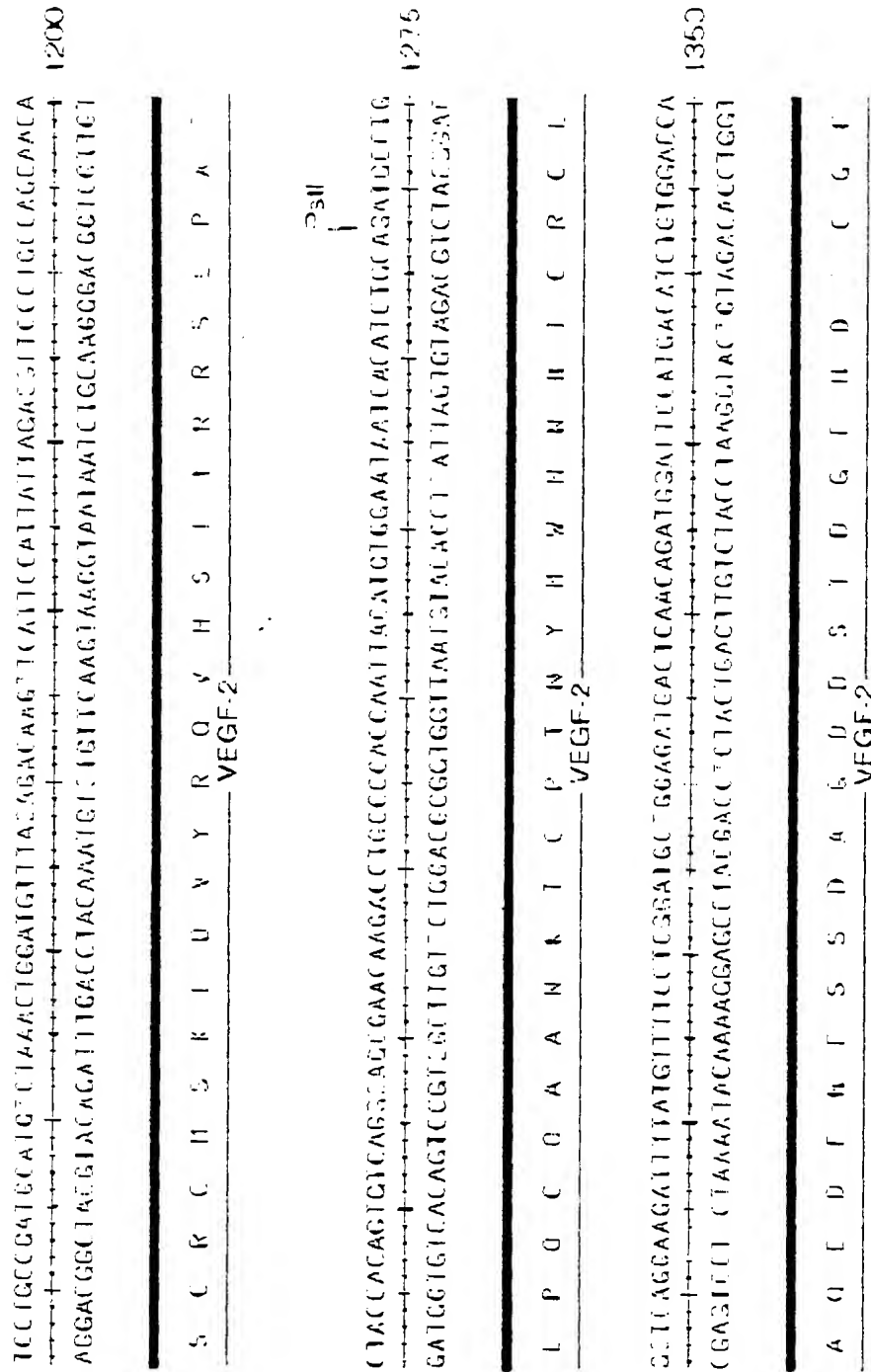
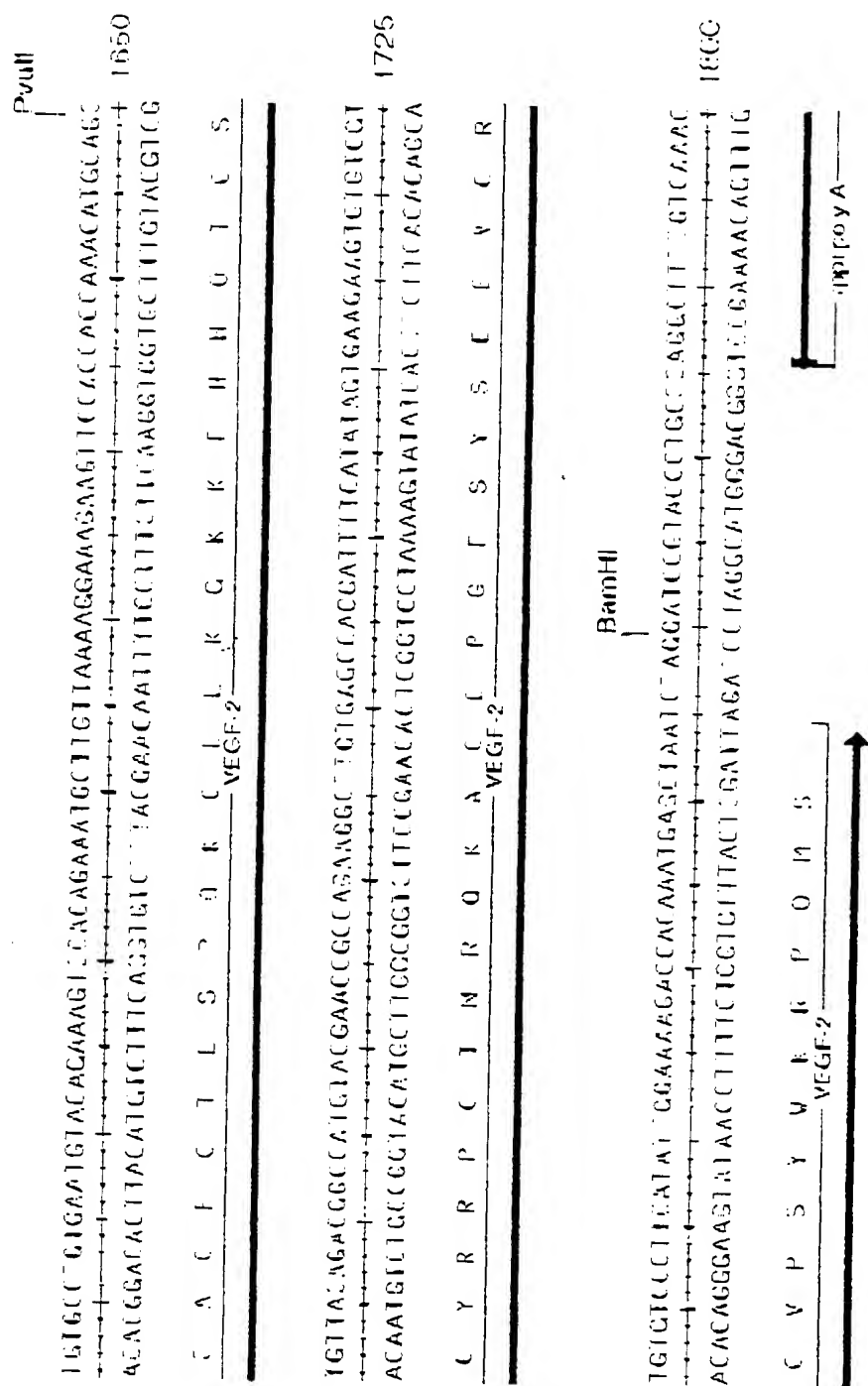


FIG.31F

**FIG. 31G**



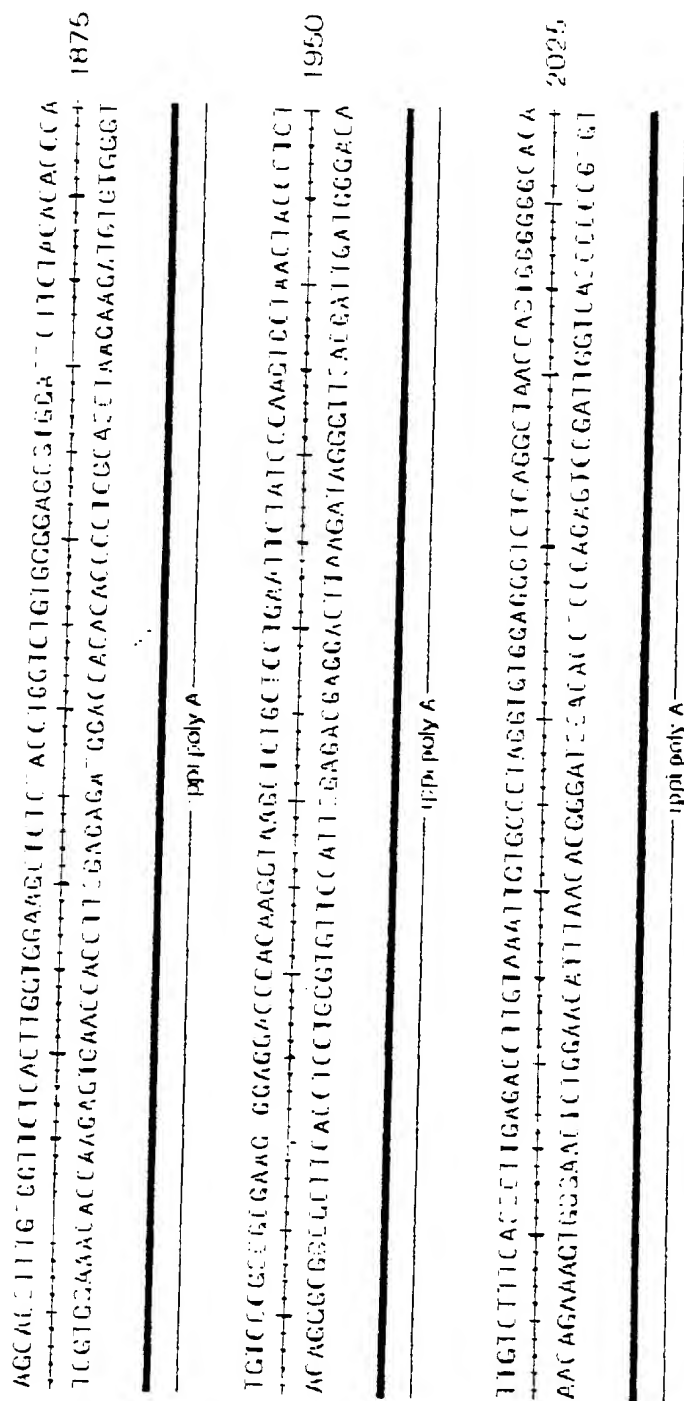


FIG.31I



TTCTCTGGGACGTACACATATGTAAACATGGTAGCTGCCAGCAAGCAGTGCAGAACTCTTCTTAAGTCTCTTA  
 AAGGATACCGTGGATCTGTATACATTTGTAATATGACGGTCTTCTTCACTCTTAACAAAGGAAATTCAGAGGAT 2100

ppp poly A

KpnI

GGTGGTACGGGTGGTAGGCTTCCAGGATAGGTACCTATTTGGGACCCCATAGAGCACGGCACTGATGAGGGA  
 CCACCACTGCCCAACGGATCCGGGTCTATCCATGGATAAAGCCCTGGGGTATCTCTGACGTGATCTGATCTCC 275

ppp poly A

TGGTAACAGGATGTGTAGCTTTGGAGGGCCATACTCTCATTCATGACTAGTGAATGCTTCACAGCCCATGCAAC  
 AGLATGTCTACACATCCAAAGCTTCCGGTATACAGGTAAATACGGTACGGTCACTGAAACAGAGTCTCGGTACGTTG 2250

ppp poly A

FIG.31J

CTTGGCTCTCTGCTGACTTAGCAGGCGGATAAGTGAACAAAGCCTGGGTAATCAGGGGCTGGCTCAGCTCT  
 GGAACGGAGGACACGACTGAACTGGTCTCTATCTCACCTCTCTTGGACCCGATTAGTCCCCACCGAGTCGAGC  
 2325

ipm poly A

TCTTAACCTGGATTGCTCTAGTCTCTTTTGGCTCTTGTCTCTCTGATGCTCTGCCCCTGCTGTGACATGACCTCTCCCTG  
 ACGATTGACCTTAACAGGATACACAGCAACGAAGACATGATGACACGAGACCGGGACACGATGTACTGGAGGGAC  
 2400

ipm poly A

SmaI

GCAGTCCACAACTGGAGCTGGGTGGAGGCCCGCGGGCAGGTGACCTTTAGACCTTGGCACTGGAGCTGGCTGG  
 CGTACCGGTGTGACCTTCGACCTCACTCCGGGCCCCCGTCCACTGGAAGCTTGGAACTGTGACCTCCACCTGGGCT  
 2475

ipm poly A

TAGAAGCCCGCCATCTGTGGATCAGTGTGCAACAGCACTGCTCTCTATCAACTGGAGACACTAC TGCAACTAG  
 GTCCTGGGCGGTAGCACCTAGTCAAGCATGTGGTCTGTAGACGAGACAGATGCTTGGACCTTTCATGACGTTGATC  
 2550

ipm poly A

FIG.31K

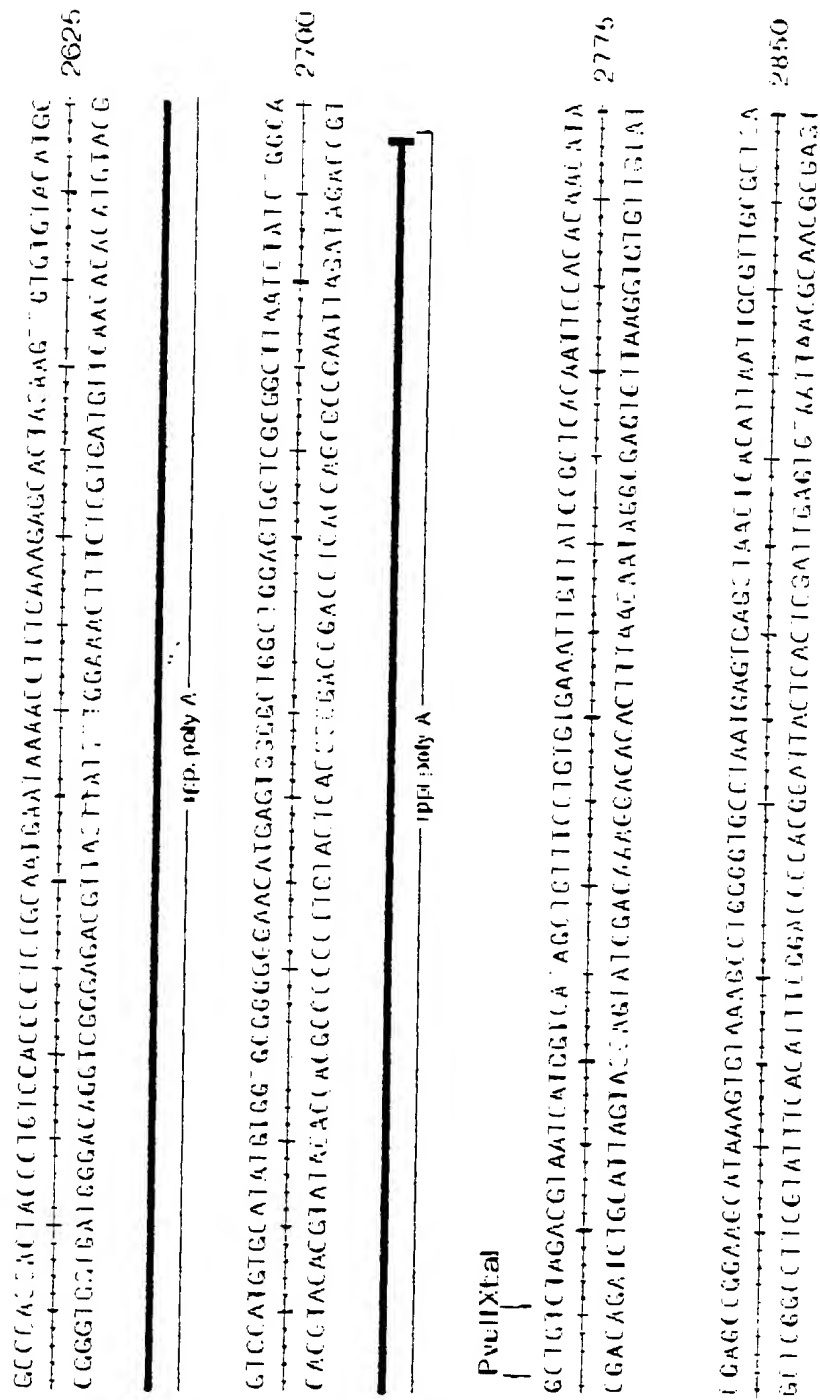


FIG.31L

GGGCGAGCAAAAGGCCACCGAACTGTAATAAGGCCCCGTTGCTGGCGTTTTCATAGGCTCCGCCCTCGATGAG  
CCGGTCGTTCGGTCTTCGTAATTTCGGCCCAACGACCGCAAAAGGTAATCGAGCTCCGGGGGAGCTCTCTC

**FIG. 31M**

**FIG. 31N**

TTCTTGAAGTGGTGGCTAAGTACGGTACACATAGAGAGACAGTATTGGTATCTGGGCTCTGGCTGAAGCCAGTT 3630  
 AAGAACTTCAACACCCGGATTGATGCCGATGTGA'CTTCTTGTCATAAACCATAGAACTGAGACGACCTTGGGTCAA  
  
 ACCTTGGGAAGAAACAGTTGGTAGCTCTTGATCTTGGCAAAACAACGACCGCTGGTAGCGGTGGTTTCTTGTCTTGC 3675  
 TGGAAAGCTTTTCTCAACCATCGAGAACTAGGGGTCTTGTCTGGTGGCGACCATCGCTACTAATAAAACAAAGC  
  
 AAGCAGCAGATTAAGCGCAGAAATAAAGGATCTCAAGAAAGATCTTGTATCTTTCTACGGGCTCTGACGCTCAG 3750  
 TTGCTCGTCTAAATCTGGCTCTTTTCTTCTTCTAGAGTCTCTAGGAAATAGAAAGATGCCCCAGATCTGGAGCTC  
  
 TGGATCGAAATCAGCTTAAGGGGATTTTGGTCAIGAGATATCTCTGACCAAAAGCGGCTATCGTCTCTCTCCAC 3825  
 ACCCTTCTTTTGGAGTGCATTTCTTAAACCACTACTAATAGTAGCTGGTTTCTGCTCGGTAGCACTGAGGGGTG

Sall

FIG.310

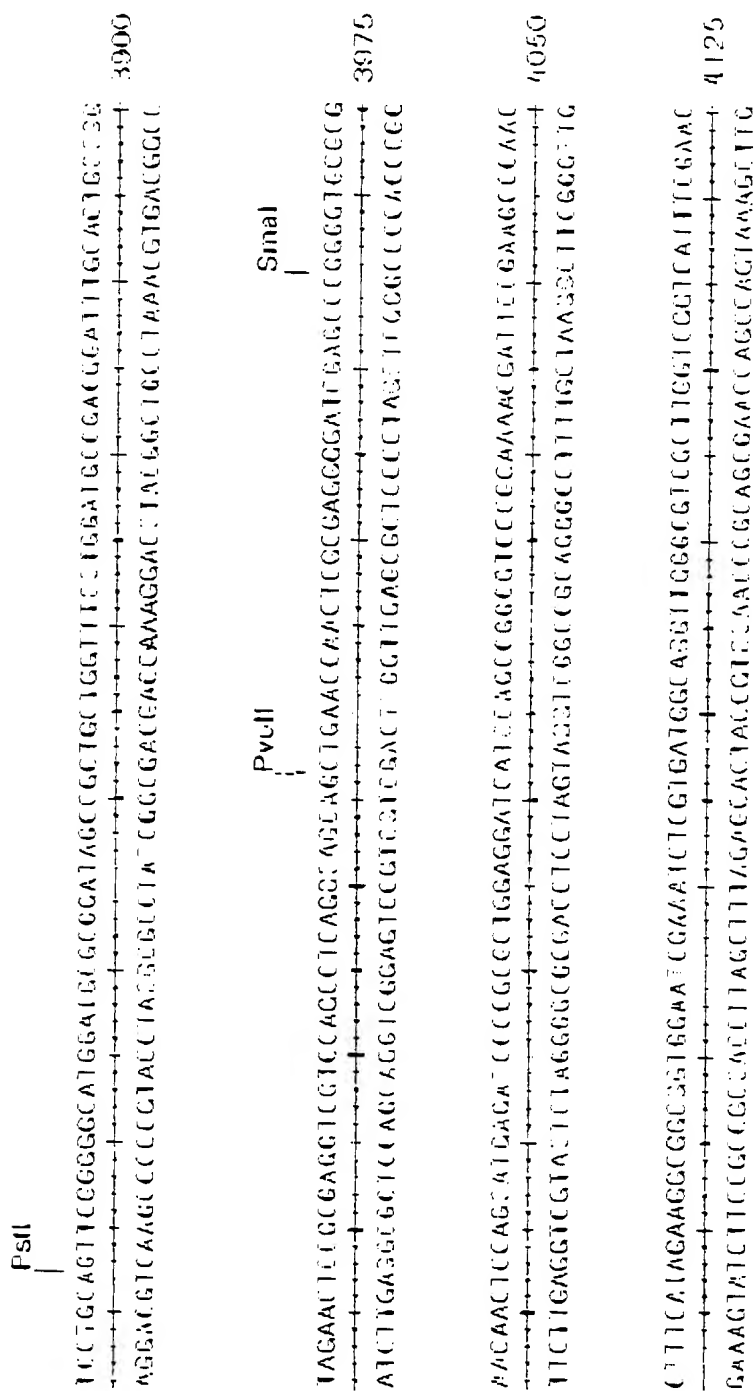
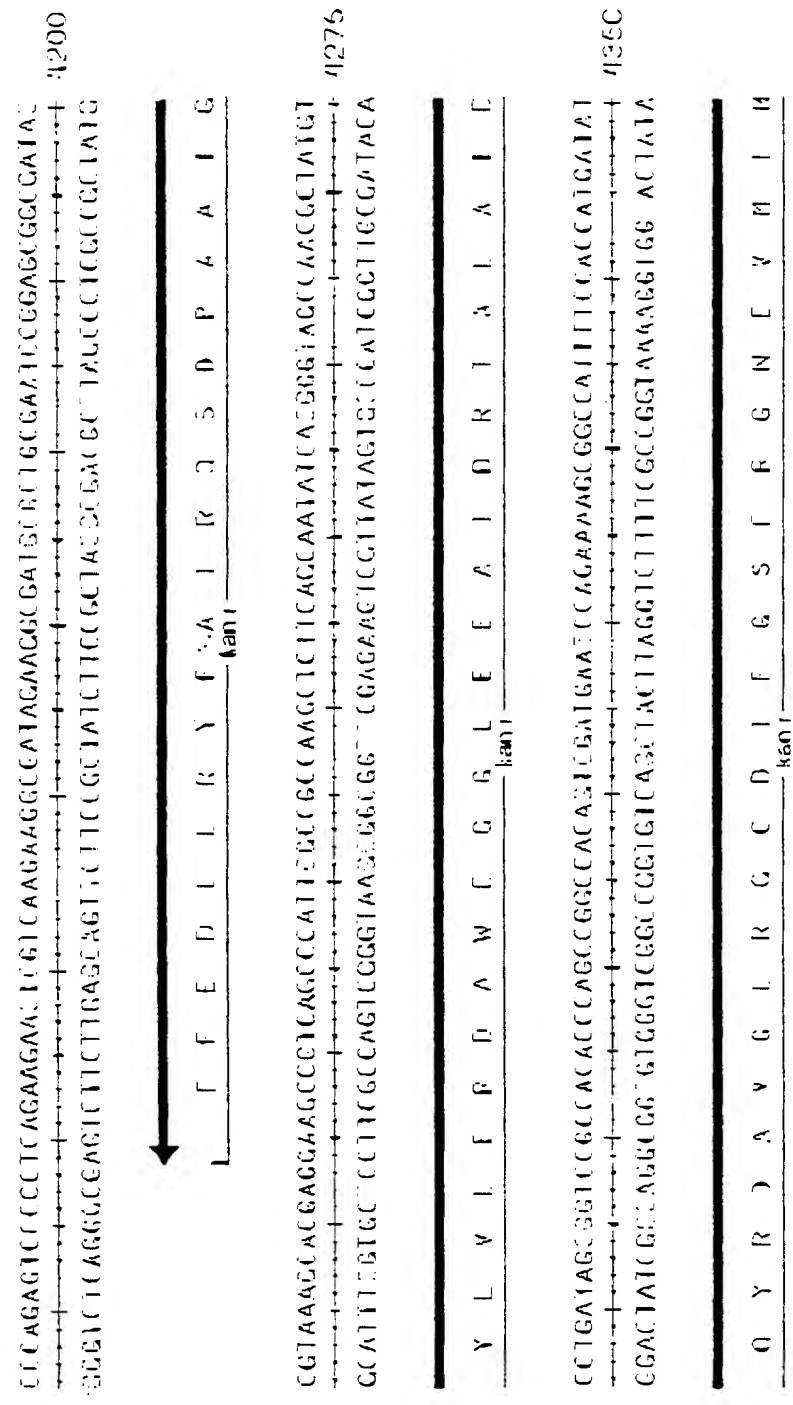


FIG.31P





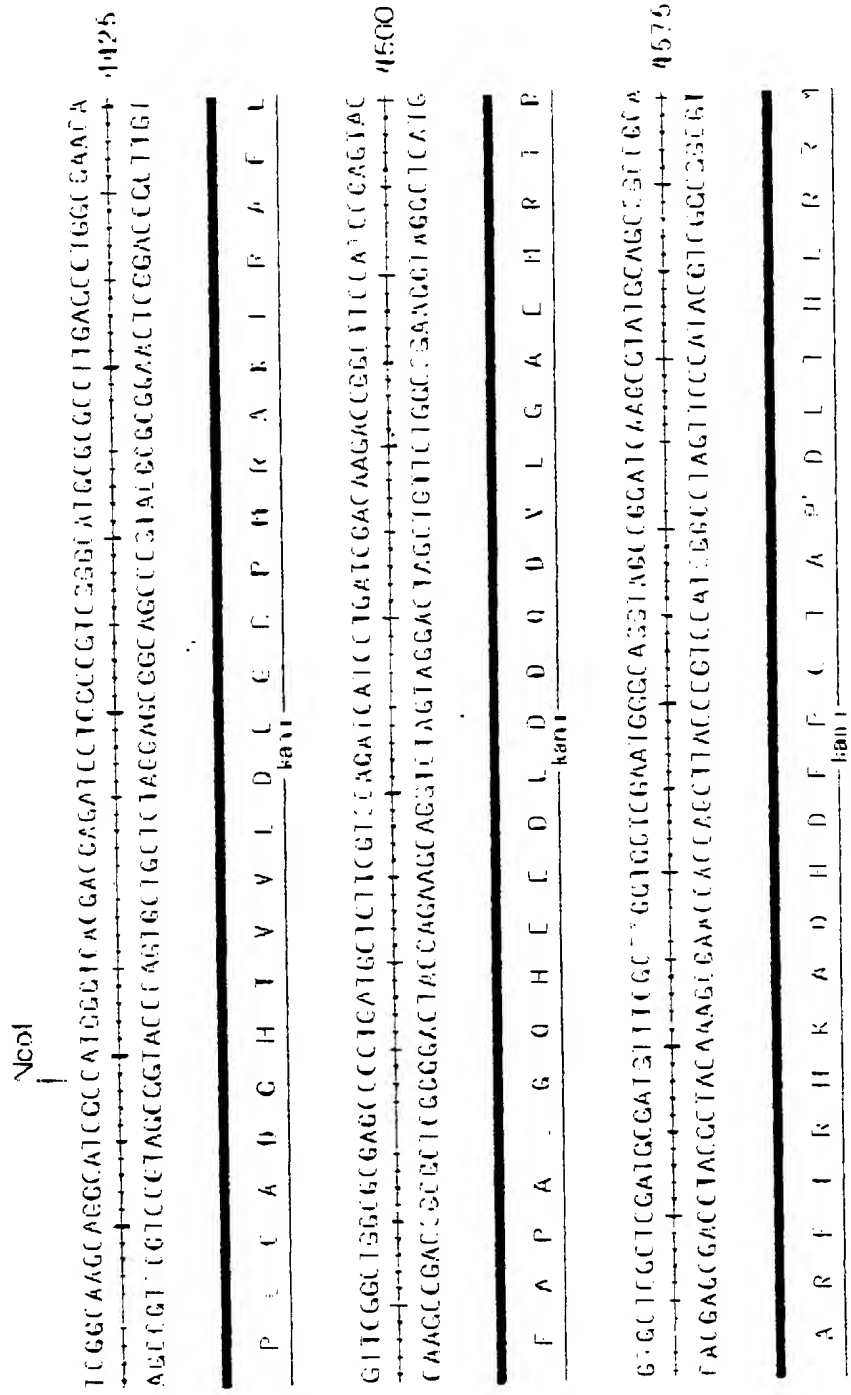


FIG.31R

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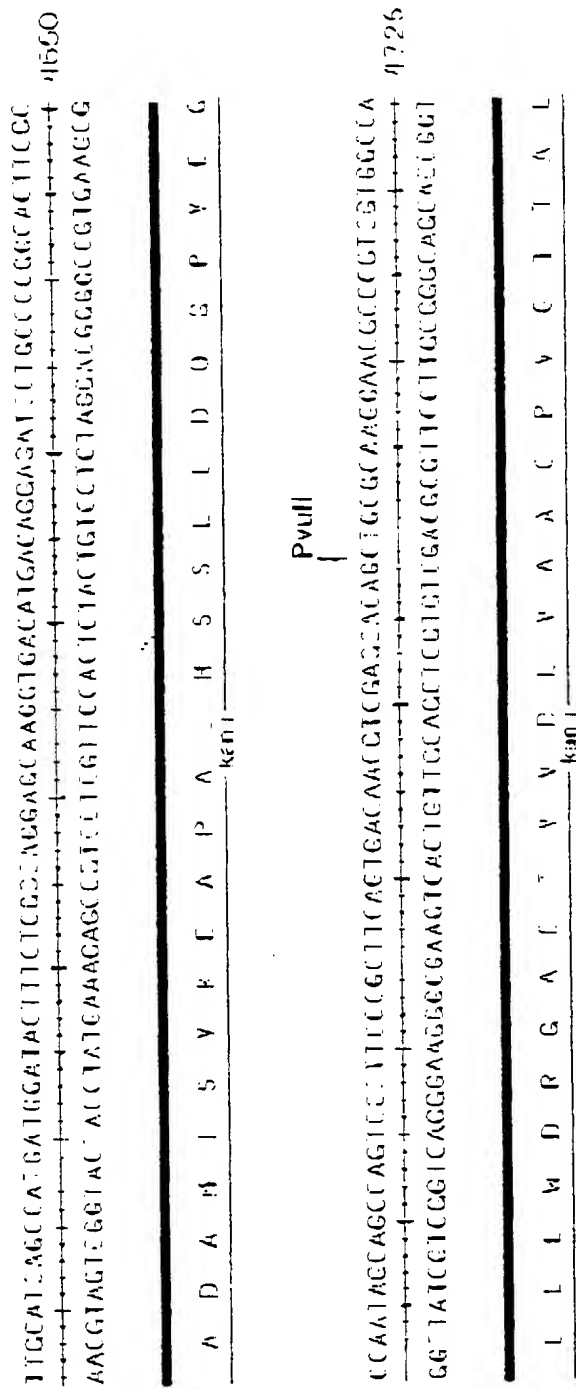


FIG.31S

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PstII

GCCACGATAGTGGCGTGGCTGGTCTGCAGTTCATTGAGGGCACCGGCACGGTCCGGTCTTGAACAAAAGAAACCG  
 4800  
 CCGTGTATCGGGTGGAGGACGACCGTCAAGTAAGTCTGGGGCTGTCACCCACCAATGTTTCTTGGG

W S I R A A C D O I E N I A G S L D Y K V F L Y P  
 kan

GGCGCCCTGGGCTCACAGCTGGAAACAGCGCGGCATCAGACCACTGGATTGCTGTGTCCTCCAGTCATAGTGGG  
 4875  
 CTGGGGGACCGCGACTGTGGCTTGGCTCCCGCTAGCTCGTGGCTAATAGACACACCGCGTCAGTATCGGCT

R G Q A S L R F V A A D S C G I I D O A W D Y G I  
 kan

ATAGCTCTCCACCTAAGCGGCTGGAGAGATTTGGCTGCAATCCATCTTGTTCATATCATGCGAAACGATCTCATC  
 4950  
 TATCGGAGACCTGGCTTCGGCTCTTGGATGGACCTTAGCTAGAACAGTTACTATGCTTTGCTAGGAGTAG

L R F V W A A P S C A H I G D C L I M  
 kan

FIG.31T

Bgl II

CTGTCCTTGATCAGATCTTGA<sup>+</sup>CCCCTECCCCATCAGATCTTGGCGGCAAGAAAGCCATCAGTTTACT<sup>+</sup>GC  
GACAGAGAACTAGCTTAGAAC<sup>+</sup>TAGGGGACGGGCTAGCTTAGGAATCGCC<sup>+</sup>CTTTCGGTAGGTCAAAATGAAACG 5025

Pvu II

AAGGCTTCCCAACCTTACCAGAGGSEGCCACG<sup>+</sup>GGCAATCCGGTTCGTTTGTGTCTCATAAACCGCCUAGT  
TCTCGAAAGGCTTGGATTCGTCTCCCTGGGCTCGACCGTTAAGGCCAAGCGAACGAGAGGTATTTGGCGGGTCA 5100

CTAGCTATCGCTATGAGGCCAC<sup>+</sup>TGCAAGTAACTTGC<sup>+</sup>TTCTCTTTCGCTTGGGTTTTCCTTCTCCACATAG  
GATCGATAGTGGTACA<sup>+</sup>TCCGGTGAAGCTTCGATGATGAAACAGATACGGCAACGTAAGAGGGAACAGGCTCTATC 5175

CCCAGTAGCTGACATTA<sup>+</sup>CCGGGCTCAGCAACGTTTCTGGAC<sup>+</sup>TGGTCTTCTAGGCTCTGTCTTCTTAGC  
GCTTCATCGACTGTAACTAGGCCCCATCTCTGGCAAGACGCTTACCTGAAAGATCCACACAGGCGAAGGAAATCG 5250

AGCCCTTGGGCGCTGAS<sup>+</sup>TGCT<sup>+</sup>GGGCAECCCTG  
TCTGGGAACGGGGACTCACTGAACGCTCTGCTAC 5283

FIG.31U

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